COMMENT-RESPONSE TABLE

General

Comment #	Section #	Page #	Comment	Draft Response
1	General	--	All references to Sediment Reduction Zones (SRZs) need to be removed from the document. EPA understands SRZs to be a temporary administrative component of MTCA/SMS and therefore it is not applicable to CERCLA sites.	Per discussion with the U.S. Environmental Protection Agency (EPA) in Comment Resolution Meeting #1 on June 12, 2017, reference to meeting the substantive requirements of a Sediment Recovery Zone (SRZ) is mentioned, if needed, to help meet Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) threshold requirements of achieving Applicable or Relevant and Appropriate Requirement (ARAR)-based Preliminary Remediation Goals (PRGs). The SRZ language has been modified to remove it as its own stand-alone potential compliance mechanism.
2	General	--	Because a specific value has not yet been established for natural background, it is impossible to know if such a future value will be able to be met. Remove all language that implies the expectation of meeting regional background, or links regional background with achievement of RAOs/ARARs.	Per discussion with EPA in Comment Resolution Meeting #1 on June 12, 2017, reference to expectation of meeting regional background is removed. However, regional background is retained as one potential method for achieving compliance with Washington State Sediment Management Standards (SMS).
3	General	--	The FS does not discuss what assumption was made about the status of the Lower Duwamish Waterway (LDW) cleanup. During modeling, assumptions had to be made regarding potential contamination coming from LDW sediment which would be dictated by whether or not the LDW was pre- or post-construction. EWG relayed during the Dec. 16, 2014 meeting with EPA, that overall the FS assumed post-LDW cleanup. The text must make this clear in the executive summary and other key locations, along with specifics incorporated with the model that align with this assumption.	Per Comment Resolution Meeting #2 on June 15, 2017, language was added to Section 5.3.1 stating that the average LDW bed concentrations (current, pre-remediation conditions) were used as model inputs. However, the model-predicted East Waterway (EW) spatially-weighted average concentrations (SWACs) are not sensitive to that parameter compared to the Green River input, so the Green River sensitivity values bound any potential impact of LDW remediation.
4	General	--	Discussion of compliance with ARARs needs to be modified for consistency to what is shown below in order to conform to EPA policy. All references to sediment remediation zones (consistent with Comment #1) and the expectation of meeting regional background levels (consistent with Comment #2) must be removed. The following language changes need to be incorporated throughout the FS, in particular to Chapter 9 in sections 9.X.2 for the discussion of each alternative. This example was taken from the first paragraph of Section 9.6.2 for Alt 1B(12), but the same changes need to be made in other sections as well. "Alternative 1B(12) is expected to comply with MTCA/SMS for protectiveness of human health for direct contact (RAO 2), protection of the benthic community (RAO 3), and protection of higher trophic level organisms (RAO 4) by achieving the PRGs for these RAOs, but it has the same ARAR compliance limitations for protection of human health for seafood consumption (RAO 1) as Alternative 1A(12) (see Section 9.5.2). Alternative 1B(12) is not likely to meet all natural background-based PRGs. Although the SMS allows for use of a regional background-based cleanup level if it is not technically practicable to achieve natural background levels, regional background levels have not yet been~~, but following source control and remediation efforts, it is expected to comply with MTCA/SMS requirements in the long-term once regional background levels are~~ established for the geographic area of the EW~~. and cleanup levels are adjusted upward. If monitoring demonstrates that cleanup levels are not achieved, compliance with MTCA/SMS can be attained through the establishment of SRZs and compliance with the requirements of WAC 173-204-590 (see Appendix A).~~ In addition, surface water quality is expected to improve, yet it may not comply with human health surface water quality standards for total PCBs and arsenic."	East Waterway Group (EWG) sent text to EPA for approval. The EPA additions and deletions were made to the text, plus an additional paragraph has been added to close the loop on what this means for compliance with ARARs with a reference to Section 4.3.1.
5	General	--	The modeling used to estimate sediment deposition and expected chemical concentration appears to be based partially on assumptions made in 2010 about the Green River's influence on the LDW. Since then, actual data has been acquired and continues to be collected about suspended solids, bed concentrations, and other parameters. It is apparent, that based upon the data, the original estimations made about the influence of chemical recontamination from the Green River on the LDW are too high. More discussion is needed between the EWG and EPA regarding additional modeling and calibration of the models based on recent data, rather than old assumptions. EWG needs to provide narrative describing what newer data has been collected since the draft FS was prepared, and how it could influence modeling results.	Per Comment Resolution Meeting #1 on June 12, 2017, no additional modeling was performed. A summary of the new suspended solids data collected by U.S. Geological Survey and King County, and explanation of how these data could potentially affect modeling outcomes, was added to Section 5.3.1 and Appendix B, Part 3B (Section 2).

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6	General	--	Make sure that "1,4-dichlorobenzene" is written with a hyphen; it is not consistent throughout the FS.	The text was modified per this comment.
7	General	--	The construction window presented in the FS is Oct 1 - Feb 15. a) Based on discussions with EWG, it appears this timeframe is based on the fish window (which allows construction July 16 - Feb 15), plus an allowance for tribal fishing (which reduces the construction window to Oct 1 - Feb 15). Based on EPA's experience, construction between July 16 and Oct 1 (the tribal fishing allowance) is possible with coordination from the Tribes. Because much of the FS alternatives analysis hinges on the years of construction (which is dictated by the length of the construction window), the FS needs to be based upon the formal fish window of July 16 - Feb 15. . b) Based on this extended construction window, update data and calculations that are influenced by the length of the construction window (e.g. years of construction, cost, etc.).	EWG provided text to EPA for review, and EPA commented on September 21, 2017. Text that incorporates EPA's comments has been incorporated into the Feasibility Study (FS) with minor changes for clarity. Based on project experience in the area, the effective construction window begins approximately October 1, which provides the best estimate for construction durations. However, the formal fish window for Elliott Bay that applies to the EW starts on July 15, which was discussed in the text, and the possible effect of a longer construction window for each construction season was discussed in Sections 9 and 10.
8	General	--	Throughout the FS when discussing cPAHs, some of the time it is noted as "cPAHs TEQ" and sometimes just "cPAHs". Be more consistent (particularly in tables) with which is being used.	Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) are discussed without the toxic equivalent (TEQ) in the text, but "TEQ" was added to all cPAH units (e.g., µg TEQ/kg dw) in both text and tables where it was not already included.
9	General	--	This comment addresses RAO 2 for arsenic. Table 9-2 shows all action alternatives achieve the arsenic PRG at year 0 (end of construction) and some continue to meet into year 5; however, no alternative meets the PRG following year 5. In addition, Table 9-6a shows that excess cancer risk for arsenic does not meet the 10-6 risk threshold. (It is noted that Table 9-6b does show achievement of the 10-5 total excess cancer risk threshold for arsenic and cPAHs combined). Throughout the FS, the description of achievement of RAOs and ARARs is inconsistent with this information shown in Chapter 9. The following are a few examples. Revise the language to reflect the data presented. 1) In Table 10-1 for Magnitude and Type of Residual Risk for RAO 2, it is described "For arsenic, action alternatives are predicted to meet the PRG following construction and may meet PRGs in the longer term depending on incoming Green River concentrations." It needs to be clarified that, i) the current model shows arsenic SWACs are not expected to meet the PRGs in the long term because of predicted incoming Green River concentrations, however, ii) given the model uncertainty, the actual incoming concentrations may be less than currently predicted which may result in achievement of the PRG. 2) In Table 10-1 for Compliance with ARARs, it is described that "All action alternatives are expected to achieve PRGs or 1 x 10-6 cancer risk threshold immediately after construction..." At year 0 this is largely true, but does not continue to be true afterward. It needs to be clearly stated that ARARs are expected to be met at year 0, but according to EPA, are not expected to be met in following years. 3) In Table 10-1 for Time to Achieve RAOs, the timeframe indicated to achieve RAO 2 for arsenic is at end of construction (when the PRGs/risk is initially achieved). But since the PRGs and risk do not continue to be achieved in subsequent years, the timeframes must reflect this. This could be done with a footnote/asterisk stating that the time shown is for initial achievement of RAOs, but that achievement is not expected to continue past year X based on modeling.	1) The table was revised to present the modeling predictions. Model uncertainty is not presented in this part of the table. 2) The text was revised for clarity per this comment. 3) Footnote J was revised per this comment.
10	General	--	The FS needs to further discuss how the EW remediation efforts are compatible with the Seattle Harbor Navigation Improvement Project (SHNIP). This deepening project is considered a reasonable future use for EW and therefore needs to be included in more detail in the FS. Details of the SHNIP project can be found in the "SHNIP Draft Integrated Feasibility Report and Environmental Assessment" dated August 2016. a) It must be explicitly stated that SHNIP is an anticipated future land use. Section 2.9.2 is an appropriate place for this. b) In the FS, describe how the alternatives and technologies chosen are compatible with the future deepening project. Based on the analysis in Appendix H, provide a summary with figures showing cores that remain above RAL/SQS or CLS following remedial action and may be impacted by SHNIP, and to what depth this impact may occur. (As a suggestion, either Chapter 9 or Appendix H seem like appropriate locations for this). c) In the FS, provide a summary noting how future dredging is anticipated to impact completed remediation work involving material placement (e.g., capping, backfilling, ENR, and RMC). (As a suggestion, Chapter 7 seems like an appropriate location for this). It is noted that USACE previously provided guidance to EPA and the Lower Duwamish Waterway Group (LDWG)	Per discussion with EPA in Comment Resolution Meeting #1 on June 12, 2017, the comment is addressed by stating that because the implementation of the navigation improvement project is uncertain, the assumptions for the EW FS alternatives are based on current conditions and uses but are compatible with the future implementation of the potential deepening of the navigation channel, and the navigation improvement would not reduce the environmental protectiveness of the remedy in the EW. a) Text was added to Section 2.9.2 to identify SHNIP as a potential future use. b) General language was added to Section 7.7.2. A footnote was added to Section 7.8.1 and text was added to Sections 8.3.4 and 9.15.2 to describe how the cleanups are compatible with SHNIP. c) Additional text notes that the deepening will not reduce the protectiveness of the remedy. enhanced natural recovery (ENR) buffers of 4 feet will be considered in remedial design.

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			as to dredging buffers that were expected to be compatible with the future use of the LDW (letter to Ms. Allison Hiltner at EPA from Mr. Stuart Cook at USACE, dated Aug. 3, 2010). EPA expects that similar buffers will be implemented in EW. This includes a 4 ft vertical cap buffer and a 10 ft horizontal cap buffer (distances between any capping and the anticipated authorized depth/width). The same buffers need to also be considered for ENR areas. d) The FS needs to discuss, qualitatively, how mixing modeling results would be influenced by the effects of the deepening project. During meetings, EWG has indicated that the deeper mixing expected from larger ships (i.e. larger propwash) is likely to lead to lower SWAC concentrations; this is a key item that must be discussed in more detail. In addition, the FS must discuss any new or different propwash impacts to contamination left behind (Appendix H) and describe how potential additional mixing of underpier hot-spot areas would be expected to affect mixing model results. EPA is NOT requiring that additional modeling be performed, but that a qualitative discussion be presented and a statement be added indicating that impacts from deepening will be addressed during remedial design.	
11	General	--	Add language that there will be meaningful input on project modifications, contingency/adaptive management issues, waivers, ROD amendments etc.	Clarification was added to Sections 8.1.3 and 8.1.5.
12	General	--	Capping should not be used in areas that would require the use of armoring to prevent scour. If scour protection is considered then mitigation of lost habitat needs to be added to the cost estimate.	All caps will have armor layers as necessary. Caps will be covered with "fish mix" or similarly suitable habitat material as required. Clarification was added to Section 7.2.5.1. Habitat was already listed as a consideration in Section 8.1.2.2 and Appendix D, Part 2 (Section 2).

Executive Summary

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13	ES	1	The executive summary discussion moves into remedial alternatives without firmly identifying potential exposure pathways (i.e., clamming areas, surface sediment, and subsurface sediments) in "Contaminant Risks" Section. Add a discussion of exposure pathways in the ES.	No change was made. The Contaminant Risks section is a very abbreviated summary page within the Executive Summary (ES). The exposure pathways are identified in the Risk Assessment section (seafood consumption, direct contact, benthic, and higher food chain animals) of the ES. For more detail, see Section 3 of the FS.
14	ES	1	2nd paragraph: These tides represent the extremes; values need to also be presented for average tides.	No change was made to maintain the appropriate level of detail for an ES and to be consistent with the main body of the document.
15	ES	1	3rd bullet: This discussion must explain that sediment contamination is the focus, supporting next section (Contaminants of Concern) declaration that primary COCs are in sediment.	"Sediments" was added to the description.
16	ES	1	Footnote 2: Add that given the short time spent in the EW by salmon, they are not expected to acquire a significant contaminant body burden from contaminants found in EW sediments.	Addition was made.
17	ES	3	Combined dredging/capping alternatives to maintain bed elevations are commonplace and need to be mentioned here and are acceptable where navigation depths must be maintained. ENR/MNR/in situ treatment approaches do not maintain bed elevations, but may be acceptable where navigation is not of concern (i.e., under piers, clamming areas).	The text was updated to include combined removal and capping technology. The text already indicates that other technologies are used to a lesser degree, and further clarification is not added to the ES.
18	ES; Figure 2	3	Figure 2 must show the complete process and indicate by highlight that the EW is currently in the FS stage.	Added Supplemental Remedial Investigation (SRI) to the process and highlighted FS phase.
19	ES	4	5th bullet: State what the natural recovery process does, i.e., eliminates chemical exposure so that the benthic community can repopulate the remediation area.	Text was added to indicate that ENR reduces chemical exposure.
20	ES	4	Definition of SWAC: Spatial weighting is a technique that can be used to correct for the influence of variable sampling density over an area of interest. Spatial weighting is done using a multiplicative relationship between the area of a sample result and the chemical concentration at that location. In densely sampled areas, the area a sample represents is small. In lower density sampling areas, the area a sample represents is large. Thus, spatial weighting reduces the significance of sample results in areas that are densely sampled and increases the significance of sample results in areas that are less densely sampled. Usually, higher density sampling occurs in areas with higher levels of contamination. Failure to utilize spatial weighting would result in estimation of average concentrations that are likely greater than the true average chemical concentrations. Add this information to the text in this section.	Text was added to Section 1.4.2 to address comment, but no change was made to the ES to maintain the appropriate level of detail for an ES.
21	ES	4	In the definition of SMS, include a description of how SMS relates to SQSs and CSLs.	Text was modified to describe the two-tiered framework of the SMS.
22	ES; Figure 3	5	The figure is not referenced in the text. Add the reference.	A reference was added.
23	ES	5	Commercial and Navigation Activities: Tribal netfishery is a future use but not shown on the figure. Add to the figure.	No change was made. The tribal netfishery is throughout the EW as described in the text.
24	ES	5	Commercial and Navigation Activities: Indicate what the authorization depth is (are), and why there are subarea boundaries within the channel.	No change was made to maintain the appropriate level of detail for the ES. See Figure 7-2.
25	ES	5	Commercial and Navigation Activities: Many terminals and slips are shown on the figure but their existence and purpose is not mentioned in the text. Add this information to the text.	No change was made. A general description is already included in the text: "Most vessel traffic consists of shipping companies that move container vessels and assorted tugboats into and out of the EW," which is consistent with the level of detail needed for the ES.
26	ES	5	Habitat: The 2014 Supplemental RI says wildlife are not abundant/important in EW, but the text here states that EW provides habitat important to various species. This is a contradiction. Clarify and explain if there are any marine mammals occupying the study area.	The text was modified to reference marine mammals and birds (although note that no contaminants of concern [COCs] were identified for marine mammals for the site). The SRI does not describe wildlife as not abundant or not important. SRI ES-33: "Despite significant habitat alterations and the presence of areas with elevated contaminant concentrations in sediment, the EW contains a diverse assemblage of aquatic species and a robust food web that includes top predators."
27	ES	5	Habitat: State what type of habitat exists that supports salmon/bull trout, and where this is located on the figure.	No change was made because the habitat for salmon/bull trout depend on the life stage of the fish and cannot be depicted with precision.
28	ES	6	In the first bullet, further define "hot-spot" in text, and reference Figure 4. While there may/not be active source areas, there are noted areas >1800 ug/kg in the EW sediments which appear to be statistically significant (i.e., > 95th percentile).	"Hotspot" was deleted for clarity. The patchwork of contamination is best exemplified by Figure 5.

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29	ES	6	The second bullet does not specifically state that the SWAC includes only surface sediment data from the BAZ. Reference footnote 3 here.	No change was made because "total PCBs surface sediment concentrations" is the subject of the sentence.
30	ES	6	In the fourth bullet, provide 95th percentile for depths of sediments exceeding the SQS, as done previously for surface sediments.	No change was made. The percentile of depth of contamination is not used in the FS.
31	ES	6	Also note that there is concern about subsurface contamination that might enter the biologically active zone due to scour or other mechanisms.	No change was made because the comment is already addressed in the Physical and Chemical Modeling section of the ES (page 10).
32	ES; Figure 5	7	Clarify the figure title by adding “marine” before “Benthic”. The text describes SMS as applicable to marine benthic criteria.	“Marine” was added.
33	ES	8	Cover Photo: The photo implies hook and line fishing is a significant exposure pathway yet the text describes only net fishing and clamming with minimal reference to hook and line as important exposure pathways. Change the figure to a photo for clamming or netfishing.	The photo was not changed; the text was updated for accuracy. The text was updated to note that the seafood consumption pathway is a significant exposure pathway, with seafood being obtained through multiple methods.
34	ES	8	First bullet: Indicate the list of analytes included in calculating cPAH.	No change was made to maintain the appropriate level of detail for the ES. See Table 2-1.
35	ES	8	Second bullet: Describe the fish/shellfish species and range of tissue concentrations associated included as “seafood.”	"Fish, clams, and crab" was added to the Risk Assessment section of the ES. For the range of tissue concentrations, the change was not made to maintain the appropriate level of detail for the ES. See Section 3 of the main body of the document and the Human Health Risk Assessment (HHRA; Windward 2012).
36	ES	8	Second bullet: It needs to be explained that dermal and incidental ingestion exposures to sediment associated with seafood, as opposed to tissue consumption of the seafood tissue itself, is a significant pathway.	No change was made. Dermal contact and incidental ingestion are part of the direct contact bullets.
37	ES	8	For consistency with Table 3-4b of the main text, review the following in the fourth bullet: "...from a hazard quotient of 242 to 59 for the RME seafood consumption scenarios..."	Changed to "up to 59" for consistency with the table (some hazard quotients [HQs] are <1).
38	ES	8 to 9	The bulleted items need clarification as to which are describing human health risk and which are describing ecological risk. Add headings/labels to the bulleted list.	Headings were added.
39	ES	8	Seafood Consumption: Describe the source of exposure being evaluated, e.g., clams only or mix species?	“Fish, clams, and crab” was added to the Risk Assessment section of the ES (bullet under new Human Health Risk heading).
40	ES	9	Two bullets are listed for ecological risk (the last two bullets); one for the 29 benthic sediment risk drivers, and one for the fish tissue risk driver. Add a bullet to show that TBT is a benthic tissue risk driver.	Tributyitin (TBT) was added to the benthic bullet.
41	ES	9	Third bullet: Previously, risks were determined by comparison to SMS; explain how/where criteria for fish tissue were derived. Also, salmon were determined non-resident species – explain what evidence exists on home range of sole or rock fish.	No change was made to maintain the appropriate level of detail for the ES. See the Ecological Risk Assessment (ERA; Windward 2012) or SRI (Windward 2014).
42	ES	9	Make to following addition: “Excess Cancer Risk refers to the additional risk of developing cancer due to exposure to a toxic substance incurred over a defined exposure period in this case lifetime exposure.”	Change was not made, as some excess cancer risk refers to childhood exposure periods.
43	ES	9	The discussion of sediment quality standards must also identify human health considerations.	No change was made. In the SMS, sediment quality standards (SQS) are marine sediment standards, whereas "SCO" applies to cleanup sites and includes benthic organisms, human health, and upper trophic level organisms.
44	ES	9	The concept of Risk-based Threshold Concentration (RBTC) must incorporate the idea that if environmental media are remediated to the RBTC that the exposed population will not incur unacceptable exposure and hazard/risk.	Definition clarified that RBTCs are used in the development of PRGs (e.g., RBTCs may be below background and thus PRG would be set to background not RBTC).
45	ES; Figure 6	10	Insert “site” in the caption for Figure 6 Conceptual Model… to be consistent in terminology.	"Site" added.
46	ES; Figure 6	10	The ES has not addressed sheet flow or seeps as possible sources of COCs. The figure needs to be revised accordingly.	No change was made. The figure addresses sediment transport only. Seeps and sheetflow are addressed as potential pathways in the main body of the FS. Note that sheetflow is captured by the lateral loading estimate, and the contribution of seeps has been determined to be negligible compared to other sources.
47	ES	10	First Paragraph: Describe the reason for the investigation - i.e., majority of chemicals are bound to sediments.	Clarification added.
48	ES	10	In the first bullet, “on average” suggests half of the locations indicate net depositional conditions. However, the text indicates that a “majority” of cores were net depositional. Clarify.	"On average" replaced with "In most locations."
49	ES	10	In the second bullet, there appears to be 2 sets of modeling results presented here: one where scouring ranges 0.5-5 ft and another being > 2 ft with conditions being the same. Provide reason and importance for differences in model predictions.	Text clarified by that it depends on the location. There are not two sets of models.

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50	ES	10	Sedimentation in the EW, third bullet: In the first sub-bullet, given 99% volume of clean sediment going into the EW and lack of ongoing COPC sources, explain why local hot spots have remained despite significant dilution processes. Similarly, explain how lateral gradients in COPCs have been maintained given these conditions.	No change was made to maintain the appropriate level of detail for the ES. Localized polychlorinated biphenyl (PCB) exceedances persist because of the interplay between incoming sediment concentrations, sedimentation rate, and mixing of sediment from propwash. See conceptual site model (CSM) in Section 2.
51	ES	10	Sedimentation in the EW, third bullet: In the second sub-bullet, discuss whether sheet flow or seeps from upland sources in addition to SOs and CSOs are contaminant sources.	No change was made to maintain the appropriate level of detail for the ES. Seeps and sheetflow are addressed as potential pathways in the main body of the FS. Note that sheetflow is captured by the lateral loading estimate, and the contribution of seeps has been determined to be negligible compared to other sources.
52	ES	11	First Bullet: Describe what chemistry changes over time have been observed to the extent that additional modeling was needed.	No change was made. Chemistry changes over time have not resulted in modification to the model.
53	ES	11	Fourth Sub-bullet: Explain if it has been determined on a case-by-case basis which locations are CSO impacted.	No change was made to maintain the appropriate level of detail for the ES. Each combined sewer overflow (CSO) was modeled independently and therefore evaluated on a case-by-case basis. In addition, two CSOs share an outfall with stormwater only discharges. See Appendix J.
54	ES	11	Footnote: Mention that dredge residuals also includes the newly exposed sediment concentrations at the new sediment-surface water interface.	The footnote was modified to focus on generated residuals because missed inventory was not factored into the model.
55	ES; Table 1	13	List the units after Total PCBs	Units were added.
56	ES; Table 1	13	Clarify how total PCBs is calculated, i.e., sum of congeners, Aroclors, etc.	No change was made to maintain the appropriate level of detail for the ES. See Table 2-1.
57	ES; Table 1	13	Footnote TBT entry as the Organic Carbon normalization step requires explanation.	No change was made to maintain the appropriate level of detail for the ES. See Table 2-1.
58	ES; Table 1	13	Add a note explaining TEQ as this is first use.	No change was made to maintain the appropriate level of detail for the ES. See Table 2-1.
59	ES; Table 1	13	Add a footnote to the table describing that achievement of PRGs will be determined by comparison with a SWAC or point concentration, as appropriate.	No change was made. The "spatial scale" column addresses this comment.
60	ES; Table 1	13	Explain in more detail how 95% UCLs are considered.	No change was made to maintain the appropriate level of detail for an ES.
61	ES; Figure 7	14	Clamming areas locations indicated in Figure 3 and Figure 7 don't appear to match. Clarify for consistency.	No change was made; the areas match.
62	ES	14	Remediation Area is based on a RAL that is normalized to organic carbon. A discussion of influence of organic carbon on risks from PCBs is needed along with an explanation of the effects of remediation on organic carbon and a prediction of its recovery and its importance on risk reduction.	The significance of the carbon normalized remedial action level (RAL) has been added as a footnote. Further discussion was not added because, as discussed elsewhere in the FS, the site is expected to equilibrate to native total organic carbon (TOC) concentrations following remediation, and therefore, the remediation is not expected to have a large effect on the organic carbon (OC) component of risk reduction.
63	ES	14	In the second-to-last sentence revise the figure reference: "…that include 7.5 mg/kg OC for total PCBs (Figure 47)."	Revised.
64	ES	14	Third paragraph: Indicate in Figure 7 where propeller scour deeper than 10 cm will occur and how deep the disturbance can extend.	No change was made to maintain the appropriate level of detail for the ES. See Section 5 of the FS.
65	ES; Table 2	15	Consistent with Comment #2. RAO1: The regional background has not been established at EW, how would you expect that RALs for PCBs and dioxins/furans are expected to meet an unestablished number? Remove reference to regional background.	The text was modified to delete the reference to regional background.
66	ES; Table 2	15	The basis of the PCB RALs needs to be more clearly stated. Add the following: 12 mg/kg OC normalized corresponds to the SQS to protect benthic invertebrates, but the basis for 7.5 mg/kg OC normalized isn't provided. Within the FS, a key consideration seems to be the relationship between the amount of dredging and feasible reduction in sediment PCB concentrations. Given that PCB PRGs can't be attained, active remediation must be accompanied by use of institutional controls (i.e. fish consumption advisories) to insure that public health is protected.	A brief rationale for the 7.5 mg/kg OC was added to the notes in Table 2.
67	ES	16	In the second bullet, clarify whether consideration was given to the habitat quality of the engineered cap.	Text was added that habitat quality is a consideration.

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68	ES	16	In the third bullet, sill areas have not been described or identified. They need to be defined here or earlier in the ES.	Reference to Figure 6 was added.
69	ES	16	In the fourth bullet, explain that benthic communities under piers are at risk and thus require sediment in situ treatment.	No change was made for consistency with the bullets for the other technologies. In situ treatment is used primarily to reduce bioavailability and toxicity and thereby improve the benthic community and reduce human health risk from seafood consumption. Not all underpier areas require remediation for remedial action objective (RAO) 3 (protection of the benthic community).
70	ES	16	In the fifth bullet, if the human health risk driver was incidental sediment contact not tissue consumption, this is an inappropriate example and requires revision.	No change was made. Monitored natural recovery (MNR) would decrease risks for both seafood consumption and direct contact by reducing surface sediment concentrations.
71	ES	16	In the second column revise the figure reference: "…with similar engineering considerations and conditions (Figure 78), and remedial…."	Revised.
72	ES	19	In the first bullet, describe depth of dredging for various alternatives (in this case 6.6 ft) relative to vertical contaminant distribution for this alternative. Given area and cy, average dredge depth can be determined: 77 acres = 372680 sq yd * 2.20 (6.6 ft) yd deep = 820,000 cy	No change was made to maintain the appropriate level of detail for the ES. See Appendix F.
73	ES	19	Fifth Bullet: It is not clear what "maximum removal" implies here. Explain. It is presumed that all alternatives will strive to dredge deep enough to eliminate the surface sediment and subsurface sediments at risk to propeller scour exposures. If that is the case, state that here.	Clarified the maximum removal "area." "Maximum removal" refers to the horizontal extent of dredging and minimizes capping area.
74	ES	19	Fifth Bullet: Describe depth of dredging (in this case 5.95 ft) relative to vertical contaminant distribution for this alternative. Given area and cy, average dredge depth can be determined: 100 acres = 484000 sq yd * 1.98 (5.95 ft) yd deep = 960,000 cy	No change was made to maintain the appropriate level of detail for the ES. See Appendix F.
75	ES	19	Sixth Bullet: The need to evaluate the 7.5 mg/kg RAL has not been explained (not included as a PRG in Table 1). Provide this explanation.	Text was added to explain the RAL of 7.5 mg/kg OC to Table 2.
76	ES; Figure 9	20	Add "action" to the title, to read: "Comparison of Action Alternatives".	Revised.
77	ES; Figure 9	20	Proposed dredge depths all average about 6 ft, although each alternative requires a significant difference in dredging volume. Discuss the proposed neat line required for constructability.	No change was made. The difference in dredge volume between the alternatives is due to the difference in dredge area. Constructability is considered with a factor that is applied to all alternatives consistently, as detailed in Appendix F.
78	ES	21	Protection of Human Health: This needs to be expanded to note that though PCBs in sediment can be greatly reduced, that PCB concentrations can't be reduced to levels associated with acceptable risks and hazards. Consequently, institutional controls, specifically fish consumption advisories, will be needed to insure that unacceptable exposures and risks will not occur. Add this language.	Language added.
79	ES; Table 4	22	Revise the table to also include the hazard quotient for PCBs. The table must also include the current risk and HQ associated with PCBs. The percentage reduction in risk and or sediment PCB concentrations from current conditions must be added.	No change was made for consistency with the level of detail for the ES. Current cancer risks and HQs are not applicable to this table. Other requested changes will be made consistent to changes to Table 10-1. See Sections 9 and 10 of the main body of the document.
80	ES; Table 4	22	Incorporate changes resulting from Comment #340.	No change was made. The risks are correct as presented (see Table 9-6 of the main body of the document).
81	ES; Table 4	22	The time frames presented are inconsistent; some are from start of construction and others are from end of construction. For example, for Magnitude and Type of Risk, RAO 2 indicates 'Years After Construction' but RAO 3 indicates "years from start of construction". Revise so that timeframes are consistent throughout this table.	RAO 3 changed to be percentage of point locations predicted to meet benthic PRGs rather than duration.
82	ES; Table 4	22	Overall Protection for RAOs 2, 3, and 4: list what COCs the data is for (as was done for RAO 1)	Change made.
83	ES; Table 4	22	Incorporate changes made to Table 11-1 resulting from Comment #350.	Change made.
84	ES; Table 4	22	Provide an explanation as to why in situ treatment is classified as Less Permanent. It will achieve concentrations below the incoming solids and potentially mix with them to reduce their influence.	In situ treatment made moderately permanent in Table 4 and Table 11-1, per Comment Resolution Meeting #3 on July 6, 2017.
85	ES	24	In the Compliance with ARARs section, there must be a discussion of the impacts of the solids from the Green River watershed and its contaminant levels on the remediation effort in the East Waterway and the ability to meet PRGs in the long-term. Also describe how propwash mixing is expected to mix remaining contamination/residuals layer with the residuals cover, and impacts this has on achievement of PRGs in the biologically active zone in the long term.	Discussion added.

Comment #	Section #	Page #	Comment	Draft Response
86	ES	24	In the second paragraph of 'Long-term Effectiveness' the following revision needs to be made for consistency with Table 4 in the ES: "All of the action alternatives are predicted to achieve PRGs or risk thresholds for RAOs 2 through 4." (Table 4 shows risk reduction for RAOs 2 and 4, not compliance with PRGs).	Change made.
87	ES	24	Long Term Effectiveness: There needs to be discussion of the inability to attain risk based concentrations and the need for institutional controls.	Discussion added of the ability to attain PRGs or risk goals, and the need for institutional controls (ICs).
88	ES	25	Short Term Effectiveness: This section must also address the point that active remediation will decrease risks more rapidly and with greater certainty than remedial alternatives with longer time frames that incorporate natural recovery.	Discussion added in the context of Alt 1A(12), which is the only alternative with MNR.
89	ES; Figure 10	26	For No Action the time to achieve RAO 4 is given as 10 years. According to Table 10-1, the English sole PRG is met after 10 years, but the brown rockfish PRG is met after 25 years. The longest timeframe (25 years) needs to be shown in this figure.	Figure revised per comment.
90	ES; Figure 10	26	The timeframes for 2C+(7.5) and 3E(7.5) should show end of construction, but the length of the bars seems incorrect for 11 and 13 years. Correct the bar length to reflect the actual length of construction.	Figure revised per comment.
91	ES; Figure 10	26	Incorporate any revisions resulting from changes to Table 10-1 and Table 11-1.	Figure 10 made consistent with changes to the main body of the document.
92	ES; Figure 11	28	Explain what this chart would look like for PCB HQ.	No change was made. The chart would be very similar for PCB HQ.
93	ES	32	CERCLA Compliance: Needs to note that institutional controls will be required.	Noted in the text.
94	ES	21	Predicted Time to Achieve RAOs: make it clearer that some PRGs are not likely to be met, but that risk is reduced.	Text was added per the comment under Short Term Effectiveness.

Section 1

Comment #	Section #	Page #	Comment	Draft Response
95	1	1-2	This is a short list and doesn't include many guidance documents (e.g., capping and MNR were used and cited in individual Appendices). This is not the place to list these documents, but change the language to read: "many guidance documents were referenced, including the following:"	Change made.
96	1.2	1-3	Paragraph 2: These "potential sources and pathways" are depicted in the CSM for the site; cite the source of the CSM. If it was the 2014 report, explicitly state this is the case. It is never said what the potential sources of contamination are, only transport and fate processes involved. Add this information	Citation removed so that "SRI" applies to the entire sentence. No information added to this section, but reference is added to the appropriate sections of the FS where this information can be found.
97	1.3	1-3	Paragraph 1: Add references to the appendices directly after each bullet.	References added. Bullets revised slightly for consistency with the referenced sections.
98	1.3	1-4	Paragraph 2: Note ")" typo after ROD needs to be deleted	Deleted.
99	1.4.1	1-5	It is not accurate to state that the CERCLA terms anthropogenic background and natural background are similar to SMS terms regional background and natural background.	Revised per comment; however, EWG believes that anthropogenic background and regional background are similar in principle.
100	1.4.1	1-5	Paragraph 2: It is confusing to introduce SMS here. Suggest moving the follow-on text to a new standalone SMS definition. Second sentence does not read well and requires revision.	SMS bullet added. The text was revised per this comment.
101	1.4.2	1-8	Paragraph 2: Add clarification that point concentrations are presented as dry wt and organic carbon normalized values.	The text was modified per this comment.
102	1.4.3	1-10	Paragraph 2: Specify whether this construction period is for this site, or is a requirement for all sites.	Text clarified that construction period is for the EW only.
103	1.4.3	1-10	Paragraph 3: Clarify that "This remedial technology" is for a selected remedial alternative, including 1 or more technologies as required.	Revised—"this remedial technology" refers to MNR.
104	1.4.3	1-10	Paragraph 3: Clarify that "contingency actions" may involve modification of the technology or methods of application.	Clarification added.
105	1.4.3	1-10	Paragraph 3: "This FS makes a distinction"; the terms have different usages and need to be separately defined. Is there monitoring involved in the natural recovery period? Clarify in the definition.	Natural recovery added as a separate definition. Site-wide monitoring is included as part of natural recovery.
106	1.4.2	1-8	Paragraph 2: Add clarification that point concentrations are presented as dry wt and organic carbon normalized values.	See Comment 101. The text was modified per this comment.

Section 2

Comment #	Section #	Page #	Comment	Draft Response
107	2.1	2-2	Clarify whether (Figure 2-1) station markers are the sediment sample locations.	Station markers were added to Figure 2-1 for clarity. No changes were made to the text because the paragraph clearly articulates that the stations are a measurement system only.
108	2.1	2-2	Describe the Sill reach environment - is this a bathymetric distinction?	A short descriptor was added for the three reaches (for consistency).
109	2.2	2-3	Paragraph 3: Describe where the dredged sediments generated to create the current channel were disposed of.	The text was revised for clarity in the first paragraph of Section 2.2.
110	2.3	2-4	Add any observation on location/magnitude of depth change from earlier bathymetry studies to present.	Information reviewed with EPA during previous work product approval meetings, but bathymetric survey comparisons were not included in the FS due to concerns of accuracy/error.
111	2.6	2-5	The statistics for the sediment composition given in the summary (e.g. 40% sand and 50% fines), needs to also indicate that there is a huge variation in these values. This is described later in section 2.6.1.1, but it needs to be mentioned in the summary as well.	Standard deviation added to footnote 4 to address comment.
112	2.6	2-6	Paragraph 1: Explain the reason for this pattern (i.e., past dredging).	Text was added per comment.
113	2.6.1.1	2-6	The description for the sediment particle composition only indicates the range and average (e.g. "fines fractions range from 1% to 92% with a mean concentration of 40%"). Because of the huge range for these, add the standard deviation (or similar statistic) if it has been determined.	Standard deviation added to footnote 4 to address comment.
114	2.6.2	2-7	Paragraph 2: “A hydrogen sulfide odor was common in the sample”. This is unexpected given the low TOC. Provide clarification.	Description is consistent with observations. Statement added that this is typical of reduced conditions.
115	2.6.2	2-9	Paragraph 1: Replace “as a result of” with “based on observations of”.	Change made.
116	2.7	2-9	3rd Bullet: Clarify if these are evidence of seeps.	These are not evidence of seeps, rather a description of site characteristics that affects hydrogeology. See Section 2.11.3.2.
117	2.9.2	2-12	Paragraph 1: While “call” may be nautically correct, “dock” or “berth” is more understandable. Make this change.	Changed to "berth."
118	2.9.3	2.14	Revise this section to reflect that the Suquamish Tribe also has a commercial fishery in the East Waterway (not just the Muckleshoot).	Suquamish Tribe added.
119	2.9.3	2-14	Paragraph 3: This is a fairly restricted area for HHRA as compared to the benthic environment impact area. This needs to be amplified in the risk assessment sections.	No change was made per Comment Resolution Meeting #4 with EPA (July 11, 2017). EWG agrees that the intertidal area is smaller than the subtidal area, but this is consistent with the expectations for a deep-water port.
120	2.9.3	2-14	Paragraph 3: Clarify if this is a significant area for sediment exposure.	Section 3 discusses exposure scenarios. This section presents what types of use the EW can have for tribes and recreational users. The paragraph references a figure that shows the intertidal areas for direct contact exposure from clamming, and exposures through netfishing can occur throughout most of the site. No change was made to this section based on this comment.
121	2.9.4.1	2-15	Paragraph 1: “There are no remaining tidal marsh…” This statement seems to contradict clamming as a significant risk/remediation driver and needs to be changed.	See response to Comment 120. The amount of intertidal area was added to Section 2.9.4.1 for context.
122	2.9.4.1	2-16	Bullet 1: Indicate whether the area has been mitigated for chemical contamination.	Clean material was imported for this restoration area. Text was clarified.
123	2.9.4.2	2-17	Paragraph 2: Explain what abundance of clams or habitat exists for these species, given the previous statement that mudflat habitat is limited.	Text was modified to clarify that these nine intertidal areas were the only intertidal areas that contained habitat for clams in the EW.
124	2.9.4.2	2-17	Paragraph 3: Indicate where there are any feeding habitats in the EW for these species.	Text was modified to clarify that these fish are expected to feed in the EW in suitable nearshore habitats.
125	2.10.2	2-20	"that were ultimately not dredged” This is not clear. Explain if this means – “will not be dredged”.	Changed to indicate these are potential dredge prisms that have not been dredged.
126	2.10.3	2-20	Paragraph 3: Quantify what the deposition rate was.	Change was not made. The reviewer is referred to Section 5 for a comprehensive discussion of sedimentation rates.
127	2.10.3	2-21	Confirm that these results were used to assess remediation methodologies later on in the FS.	Text was added to indicate that the information collected during dredging and sand placement was used to inform technology assumptions in the FS, as well as the time 0 concentrations following sand placement used in modeling.
128	Table 2-1	2-27 and 2-28	There are several discrepancies between data presented in this table, and data presented in the SRI. Revise the table as needed or indicate why the data presented is different than the SRI data. If these changes affect subsequent calculations, be sure to update those as well. a) For surface sediment total PCBs, the median is listed as 270, however in the SRI Table 4-23 it is listed as 290. This needs revision. b) For surface sediment cPAHs intertidal composite ("15/15" row), no median was calculated, however in the SRI	The table has been updated to include U.S. Coast Guard (USCG) data based on additional quality control (QC): a) Revised with USCG data and QC. b) Added. c) Revised with USCG data and QC. d) Added rounded value (2 significant figures).

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			Table 4-39 it is given as 230. This needs revision. c) For surface sediment cPAHs grab ("233/240" row), the median was given as 220, however in the SRI Table 4-39 it is given as 230. Revise for consistency. d) For surface sediment dioxin TEQ subtidal composite ("13/13" row), no median was given, however in SRI Table 4-34 it is given as 15.6. Revise for consistency. e) For surface sediment dioxin TEQ grab ("11/11" row), no median was calculated, however in SRI Table 4-34 it is given as 16.6. Revise for consistency. f) For MIS composite PCBs area-wide ("3/3" row), no median was calculated, however in SRI Table 4-23 it is given as 770. Revise for consistency. g) For MIS composite cPAH area-wide ("3/3" row), the mean is given as 450, however in SRI Table 4-39 is given as 1,000. Revise for consistency. h) For MIS composite cPAH area-wide ("3/3" row), no median was calculated, however in SRI Table 4-39 is given as 780. Revise for consistency. i) For MIS composite arsenic area-wide ("3/3" row), no median was calculated, however in SRI Table 4-44 it is given as 9.1. Revise for consistency. j) For MIS composite arsenic public access ("1/1" row), the superscript footnote on detection frequency needs to be a "j" not an "i". Revise. k) For MIS composite dioxin TEQ area-wide ("3/3" row), the superscript footnote on detection frequency needs to be an "i" not a "j". Revise. l) For MIS composite dioxin TEQ area-wide ("3/3" row), no median was calculated, however in SRI Table 4-34 it is given as 13.2. Revise as appropriate. m) For MIS composite dioxin TEQ public access ("1/1" row), the superscript footnote on detection frequency needs to be a "j" not an "i". Revise. n) For subsurface dioxin TEQ (last row), add "TEQ" following the contaminant name.	e) Revised with USCG data and QC. f) Added. g) Revised per QC with SRI data. h) Revised per QC with SRI data. i) Added. j) Corrected per comment. k) Corrected per comment. l) Added. m) Corrected per comment. n) Per Comment 8, TEQ has been made consistent in the document units (not part of analyte names).
129	2.11.2.1	2-29	Based on FS Table 2-1 and SRI Table 4-39, revise the following at the end of the first paragraph (following the table notes): "cPAHs were detected....with concentrations ranging from ~~1,90018~~ to 17,000 ug TEQ/kg dw (Table 2-1)." (1,900 is the mean value, not the minimum).	Text revised per comment.
130	2.11.2.1	2-34	Following the discussion about how many chemicals had exceeded at how many locations (page 2-30), further discussion is given for mercury and TBT but no others. It would be appropriate to add a discussion of the other chemicals as well.	Paragraphs deleted to treat the chemicals in a consistent manner. The information is clearly presented in Table 2-2 for all benthic COCs.
131	2.11.2.1	2-34	Correct the typo at the end of the first paragraph: "...0.30 mg/kg dw (SRI Map ~~4-3536~~; Windward..."	Sentence deleted.
132	2.11.2.1	2-34	Correct the typo at the end of the second paragraph: "...(Figures 2-19a ~~throughand~~ 2-19~~cb~~)."	Sentence deleted.
133	2.11.3.2	2-37	Bullet 2: Tidal pumping causing groundwater discharge/seep generation must be explicitly included/addressed in the CSM.	Tidal pumping added to the groundwater discharge bullet.
134	2.11.3.2	2-39	See previous comment: Lateral discharge needs to include seepage and must be explicitly stated.	"Seepage" added.
135	2.11.3.2	2-39	Text indicates “extensive groundwater and seep information is available” but following text only discusses groundwater results. Summarize the seep sample results.	Text summarizes groundwater quality in areas where exceedances of groundwater reference values are present. Reference has been added to seep data contained in Appendix J of the SRI, but no seeps exceeded the seep trigger level in that appendix.
136	2.11.3.2	2-40	Groundwater monitoring should resume at both USCG and T-25 due to exceedance of contaminants in both groundwater and sediment. If data indicates that groundwater is an ongoing source for sediment contamination, source control should be conducted.	Additional groundwater monitoring is not required as part of this SRI/FS. Groundwater will be considered as part of the source control sufficiency evaluation during remedial design. Additional text was added to summarize additional details from the SRI related to the comment.
137	2.13	2-48	Add a discussion as to whether PCBs are an ongoing source and if multiple sources can potentially exist. Explain if chemical fingerprinting has been performed to determine whether unique sources exist.	Consistent with the section heading, a bullet has been added from the SRI regarding sources of contaminants generally. Contaminant sources are discussed more in the SRI. Through the FS modeling process, which quantifies PCBs loads from various pathways based on the best available information (Section 5 and Appendix J), the potential for PCB inputs to recontaminate sediments is evaluated.
138	2.13	2-49	Another bullet needs to be added in this section to briefly summarize sub-surface sediment conditions	Bullet added.

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139	2.14.1 & 2.14.2	2-50	Both of these sections describe geotechnical properties. It is unclear what the difference between these two sections is. These sections need to be combined, or rearranged so that it is clearer why there are two separate sections.	Sections combined.

Section 3

Comment #	Section #	Page #	Comment	Draft Response
140	Ch 3	All	The discussion regarding the development of the seafood consumption pathway should be expanded to more fully explain that the tribes agreed to use the Tulalip consumption rate as the human health RME based on experience that risk-based scenarios will result in concentrations below natural background levels. The Suquamish Tribe does not agree that Tulalip consumption rates accurately represent potential Suquamish exposures or risks.	Text was added to Section 3.2.1 based on language in the HHRA ES page ES-5 (also consistent with subsequent sections of the HHRA [e.g., Section B.3.1.1, Page 29, and Section B.3.3.1, Pages 43-44]).
141	Table 3-1	3-4	Revise table name to indicate surface sediment.	Added.
142	3.2.1	3-10	This text needs to be struck: "However rates may be achieved in the EW at some future time. ~~he rates used are generally similar to those for other populations who consume large quantities of seafood in th e absence of seafood consumption health warnings."~~ Additionally, it needs to be noted that seafood consumption rates relevant to Puget Sound should be used to assess risks for smaller cleanup sites within Puget Sound. Using the argument that small areas can't support FCRs relevant to Puget Sound will result in failure to restore Puget Sound to a state that will permit Native Americans and other high fish consuming populations to safely consume the large quantities of fish that they desire. In the case of certain Native American tribes, these high fish consumption rates are guaranteed by treaties signed by tribes and the U.S. government. Further information needs to be summarized on the basis of selecting FCRs based on Tulalip Tribes' data for RME vs. Suquamish Tribe data. Specifically, that EPA's Puget Sound Tribal Seafood Consumption Risk Assessment Framework was used to determine whether Tulalip or Suquamish Tribal data were appropriate for EW risk assessment purposes. The Framework provides a starting point for EPA in discussions/negotiations to develop seafood consumption risk assessments. For the LDW HHRA, the Suquamish Tribe did not object to the use of an FCR based on Tulalip Tribes' data, as background COC concentrations exceeded risk based COC concentrations, regardless of which tribal data were used. The Suquamish position on the EW HHRA needs to be noted here. Reference earlier comments from the Suquamish Tribe (e.g. Comment #140) or the EW SRI.	• Deletion made per comment. • Additional text about Puget Sound not added because it is beyond the scope of the FS. • Per the third part of this comment and Comment 140, text from the HHRA was added to Section 3.2.1 regarding Suquamish seafood consumption rates.
143	3.2.1	3-11	There should be further discussion of HHRA for PCBs. Specifically, PCB cancer risks may be assessed using total PCBs and the Aroclor slope factor or dioxin-like PCB TEQs and a dioxin slope factor. Bioaccumulation processes may enhance the carcinogenic risk of commercial PCB mixtures. The total risk posed by environmental PCBs is bounded on the lower end by total and dioxin-like PCB risks considered separately, and at the upper end by the sum of these individual risk estimates. It is recognized that the dioxin-like PCB contribute to cancer risk estimates posed by total PCBs and that the sum of total PCB and PCB TEQ risk estimates likely involves double counting of risk.	Clarification made in footnote 24 based on language in the SRI. Table 3-4a revised for clarity.
144	3.2.1	3-13	Revise as follow: "…seafood consumption categories (i.e., fish, crabs, clams, geoduck, and mussels) across receptor types." Also note that risk associated with many chlorinated pesticides was based largely on non-detect results.	Because in this context, these are not receptors; text was instead added to note these represent a market basket of different seafood types. Receptor type of characterization is used in the ERA, not the HHRA. A footnote was also added for pesticides.
145	3.2.1	3-12 & 3-13	When discussing the total excess cancer risk as shown in Table 3-4a, clarify which of the two "total excess cancer risk" rows is being used. Both are presented in the table, but only one is used in the narrative discussion.	Clarification made to footnote 24 and table footnoted for clarity.
146	3.2.1	3-13	Note that the higher contribution of cPAHs to overall children's cancer risks is because cPAHs have a mutagenic mode of action and pose greater risks to children than adults. EPA risk assessment procedures account for the greater cancer risks mutagens pose to children.	Note added to Table 3-4a.
147	Table 3-5	3-18	Include PCB TEQ risks.	PCB TEQ risks added to the table (but not added to the total risk estimate, per HHRA methodology).
148	Table 3-5	3-18	The second column indicates "% of total", but Table 3-4a presents two "total excess cancer risks". Add a footnote to this table (3-5) to indicate which total was used to determine this percentage.	Footnote added to Tables 3-5 and 3-4b for consistency.
149	Table 3-5	3-18	A suggestion: This information would be much better presented as pie charts.	Change not made for consistency with previous presentations. This same information is also available in the HHRA (including the pie charts). This section in the FS is just a summary of the HHRA.

Comment #	Section #	Page #	Comment	Draft Response
150	3.2.2	3-20	Include the number of days of exposure (i.e. 120 days per year) for the RME clamming scenario. Note that the 183 day per year clamming scenario was to typify high end exposure and was included at the request of the Suquamish Tribe. Also note that the total HI for any exposure pathway was less than 1.	Change made.
151	3.2.2	3-21	Although the criteria for direct contact COC consideration were exceedance of a cancer risk of 1 x 10^{-6} or an HQ of 1, the total HI for each exposure scenario did not exceed 1. Therefore, non-cancer hazard was not the basis for selection of any direct contact COC.	Change made.
152	Table 3-8	3-25	Also note that many of the analytical results upon which exposure point concentrations (EPCs) were based consisted of non-detects.	Note added for PCP and pesticides.
153	Table 3-8	3-25	Since pesticides are addressed in this table, include discussion of analytical results and historical use either in the table footnote or the corresponding text.	Additions made to note b.
154	Table 3-10	3-28	For the risk levels in the column headings, change to the scientific notation (e.g. 10^{-6}) to be consistent with how risk levels are discussed elsewhere in the FS.	Change made.
155	Table 3-12	3-30	The equations notate the ingestion rate as "1R", it needs to be revised to "IR".	Change made.
156	3.3.4	3-33	Revise the last sentence to indicate that clam cPAH monitoring following sediment remediation is required: "…monitoring following sediment remediation and source control will may be needed to determine…"	Change made.
157	Table 3-13	3-34	Add a footnote to indicate an RBTC for cPAHs was not determined (as described in the preceding narrative).	Note added.
158	3.4	3-35	Identify that arsenic was not a COC for seafood consumption because although total risk posed by arsenic was significant, the site related increment of risk was not. Additionally, there doesn't appear to be any discussion of seafood background arsenic concentrations. This should be added.	Text was added consistent with Table 3-8 and Section 6.5 of the SRI. Information on seafood background arsenic concentrations is presented in the HHRA. The level of detail presented in the FS is consistent with what is in SRI Section 6.5 (Summary of Risk Drivers).
159	3.4	3-35 to 3-36	In the "Key findings for the baseline HHRA," repeat here that arsenic risks posed by seafood consumption were not significantly elevated above background.	Added to the key findings for the baseline HHRA section.
160	Figure 3-1	3-38	Clarify how clamming areas were identified. (e.g., water depth, substratum site use, other?)	Text was added for clarification.

Section 4

Comment #	Section #	Page #	Comment	Draft Response
161	Chapter 4	General	Add a discussion that states for contaminants where RBTCs can be met, the PRG needs to be set such that following remediation, the 95% UCL on the mean concentration results in HIs of 1 or less for chemicals with a similar mode of toxicity and cancer risks of 1 in 1,000,000 to 1 in 10,000. For chemicals where RBTCs are less than background, remediation needs to occur until the waterway and background contaminant distributions are not significantly different. This would likely be determined using a non-parametric group comparison test. Another approach that is used in the FS that requires further discussion between the EPA and EWG, would be to examine inputs from the LDW, Elliott Bay, and lateral loading after source control has been implemented. This is less prescriptive than the other approaches.	Per Comment Resolution Meeting #3 (July 6, 2017), clarification added to Section 9.3. The compliance metric is not finalized at this time; however, acknowledgement is made that 95% upper confidence limit on the mean (UCL95) is a likely compliance metric in Section 4.4 and the footnote of the RAO 1 discussion of Section 4.2.1.
162	Table 4-1	4-3	Fix the following typos: a) "Dredge/Fill…." row, and "Federal" column: remove extra closed parenthesis after "33 CFR 320-330". b) "Floodplain Protection" row, and "Federal" column: remove extra closed parenthesis at end	Typos revised.
163	Table 4-1	4-3	Include CERCLA and compliance with CERCLA guidance in this table.	Note added.
164	4.2.1	4-7	Clarify that HI>1 generally warrants a response action, but that the HI includes both background plus site-specific exposure, so achieving HI< 1 may not be possible.	Text was added to the footnote.
165	4.2.1	4-7	2nd full paragraph: To be more consistent with the SMS rule, state that the SMS target for the SCO is a RBTC risk of no greater than $1x10^{-6}$, and the target for the CSL is a RBTC risk of no greater than $1x10^{-5}$.	Additional detail added and reference made to Appendix A.
166	4.2.1	4-7	"RAO 1: Reduce risks associated with the consumption of contaminated resident EW fish and shellfish by adults and children with the highest potential exposure to protect human health." RAO 1 needs to include language regarding the protectiveness of contaminant concentration reduction. A threshold criterion is the protection of human health. It is noted that achieving this RAO may require institutional controls once active remedial alternatives have been exhausted; this needs to be discussed in this section of the FS. More conversation between EWG and EPA on this topic is needed.	No change was made. Per Comment Resolution Meeting #2 (June 15, 2017), EWG agreed to add language regarding ICs to further reduce risks. However, text is already included in the last sentence of the RAO 1 section.
167	4.2.1	4-7	"Lifetime excess cancer risks from human consumption of resident EW seafood are estimated to be greater than 1×10^{-5} for some individual carcinogens, and greater than 1×10^{-4} for carcinogens cumulatively under RME seafood consumption scenarios." Actually, for all of the individual risk driver COCs for the RME tribal seafood consumption pathway, the risk exceeds 1×10^{-4} (e.g. cPAH TEQ-1×10^{-4}, total PCBs-1×10^{-3}, PCB TEQ-7×10^{-4}, Dioxin Furan TEQ-1×10^{-4}). Revise this sentence to be consistent with this data.	No change was made because 1×10^{-4} is not considered to be exceeding 1×10^{-4}.
168	4.2.1	4-8	2nd paragraph: "…anadromous fish are not included" (i.e., salmon). Clarify if any other named receptors also fall into this category.	No change was made. Anadromous fish are the only seafood that fall into the category of spending most of their lives outside of the EW.
169	4.2.1	4-9	RAO 2 needs to include language regarding the protectiveness of contaminant concentration reduction. A threshold criterion is the protection of human health. There needs to be mention in this section that achieving this RAO may require institutional controls once active remedial alternatives have been exhausted.	ICs language added to this RAO 2 section in a format consistent with RAO 1 section text.
170	4.2.1	4-10	Paragraph 1: Indicate that earthquakes could increase exposure by mixing/liquefaction of surface and subsurface sediments	No change was made; seismic risks are already mentioned in the footnote to the paragraph, and potential seismic mixing is not expected to increase exposure compared to other forms of mixing in the waterway.
171	4.2.1	4-10	Risk from direct contact from clamming is assumed to occur in the upper 25 cm based on harvest of butter clams, littleneck clams, and cockles. Based on the SRI, Eastern soft-shell clam have also been found in EW, and are expect to be harvested. This is significant because Eastern soft-shell clams burrow to a depth of about 45 cm. LDW also includes Eastern soft-shell clams, because of which the LDW ROD considers 45 cm as the compliance depth. Revise the expected exposure depth to 45 cm for consistency with LDW and to reflect the presence of the Eastern soft-shell clam in EW.	Per Comment Resolution Meeting #1 (June, 12, 2017), no change was made. The 25-cm compliance depth has already been established for the site and is appropriate, as established in HHRA and SRI based on distribution of clam species in intertidal areas.
172	4.2.2	4-12	At the end of the first paragraph in this section it is stated, "The recontamination predictions indicate that…" Give a reference to where the results of the recontamination analysis is presented.	Reference provided.
173	4.2.2	4-12	Paragraph 3: Reference the section where source control activities for PCBs being considered are discussed.	No change was made. Source control activities are referenced. There is no independent source control for PCBs.

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174	4.2.2	4-12	Paragraph 3: Indicate that fate and transport (i.e. distribution and depth) of current PCBs as the key risk driver has not been explained and may be a major impediment to achieving RAOs.	No change was made. The distribution and depth of PCBs in sediments is presented in Sections 2.10 and 2.11.
175	4.3.1	4-14 to 4-17	This section seems to suggest that the SMS defines EPA's position on the various RAOs. It must be clear that the SMS does not define EPA's view as to how these RAOs satisfy CERCLA, and that EPA's views are considered independently from satisfaction of Ecology's SMS Rule, even though some of these considerations are the same.	Per Comment Resolution Meeting #1 (June 12, 2017), a reference to CERCLA was added to the introductory paragraph.
176	4.3.1	4-14 to 4-17	When first discussing RAOs, include the area of concern associated with them. Similarly, when describing SMS indicate that it applies on a point by point basis.	Exposure areas added to the paragraphs.
177	4.3.1	4-14	2nd paragraph: The text says "Under the SMS, sediment cleanup standards may be established…" Revise the nomenclature to be more in line with SMS, and call the sediment cleanup standards by their correct name of sediment cleanup level (SCL).	Text was modified per comment.
178	4.3.1	4-14	2nd paragraph: Later in the same paragraph "The cleanup level may be adjusted…" Use SCL instead.	Text was modified per comment.
179	4.3.1	4-14	2nd paragraph: The relationship between the SCL and PRG must be made clearer in the text. Change the paragraph to read: "The SCO is the higher of the risk-based levels (1x10-6), PQLs, and natural background. The CSL is the higher of the risk-based levels (1x10-5), PQLs, and regional background. The SCL is originally set at the SCO, but may be adjusted upward to the CSL. As such, the SCL in SMS is equivalent to the PRG in CERCLA."	The relationship between the SCL and PRG was made clearer in the text. Quoted comment was reworded for clarity.
180	4.3.1	4-14	2nd paragraph: Appendix A does a better job of discussing this using language from the WAC. Revise the discussion here to be consistent with Appendix A.	Text revised for consistency with Appendix A, and Appendix A reference added.
181	4.3.1	4-15	Paragraph 2: Move this paragraph about natural background to after the third paragraph of Section 4.3.1 (i.e. following the discussion of RAO 1).	Text was modified per comment.
182	4.3.1	4-15	Paragraph 2: Clarify that natural background is the default in areas where regional background has not been determined, assuming it is higher than the PQL, or risk based concentration.	Text was modified per comment.
183	4.3.1	4-15	Paragraph 3: Clarify that although regional background is not separately evaluated it is inherently included in the total exposure estimate.	Text revised to indicate that the predicted performance of the alternatives includes the influence of urban nonpoint sources of contamination.
184	4.3.1	4-16	At the end of the page it is stated, "…as discussed in Section 4.3.1." Since this is written in section is 4.3.1, verify that this section reference is correct. If so, change to "earlier/later in this section".	Revised to 4.2.1.
185	4.3.2	4-17	Paragraph 2: "Sediment RBTCs for total PCBs were calculated for the $1x10^{-4}$ excess cancer risk…" Clarify that, if following SMS, this shouldn't exceed $1x10^{-5}$ for the CSL. Ultimately it doesn't matter as the RBTC is below natural background.	Comment not addressed for clarity. SMS risk levels of 10^{-6} and 10^{-5} are discussed in a footnote and also in Section 4.3.1.
186	4.3.2	4-17 to 4-18	Indicate that compliance with risk based standards will be determined using the 95% UCL on the mean.	Footnote added.
187	4.3.3	4-18	There should be a discussion of arsenic background tissue concentrations and their relationship to site tissue concentrations supporting that arsenic is not a site related COC.	No change was made. See response to Comment 158. This section addresses the development of PRGs only.
188	4.3.3.1	4-19 to 4-23	The impact of analytical sensitivity on background concentrations needs to also be evaluated by setting non-detects to zero.	No change was made. Per Comment Resolution Meeting #3 (July 6, 2017), the text was reviewed for accuracy in communicating the methods used by EPA and Ecology. Per the Comment Resolution Meeting, additional analysis was not necessary to address the comment.
189	Table 4-3	4-21	The SMS-defined natural background value for 'Total PCBs as Congeners' is not consistent with the current (2015) version of SCUM II and must be revised. Also revise this value where it is included elsewhere in the FS (e.g. Appendix. A).	Footnote revised for clarity. The current Sediment Cleanup Users Manual (SCUM) II contains total PCBs values.
190	4.3.3.1	4-22	Footnote 37 indicates that an updated SCUM II is anticipated in summer 2016. As this date has now passed, update the expected SCUM II revision date, or remove this footnote.	Footnote updated.
191	4.3.3.1	4-22	Briefly describe what 90/90 UTL means.	Text was modified per comment in the first instance of use.
192	Table 4-4 & Appdx A, Part 2	4-25 & 2 in Appdx	Check inconsistency in reported fish risk PRG values derived using the mean of the tissue RBTCs. Appendix text (page 2) indicates that FWM-derived values were 390 ug/kg dw for English sole and 230 ug/kg for brown rockfish while tables (in Appendix and main report) indicate 370 ug/kg for English sole and 250 ug/kg for brown rockfish. Revise as needed for consistency throughout the FS.	Appendix A, Part 2 text updated to reflect 370 µg/kg for English sole and 250 µg/kg for brown rockfish.

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193	Table 4-4	4.25	There needs to be a discussion of developing tissue PRGs for PCBs. This will be important in examining adequacy of remedial actions in cases where it is difficult to determine the relationships between levels of contaminants in sediment and tissue. Evaluation is required for the uptake of contaminants in seafood following remediation activities. Tissue trends will need to be examined.	No change was made. Comment already addressed in the last paragraph of Section 4.4. Per Comment Resolution Meeting #1 on June 12, 2017, consistent with the approach in the LDW, tissue target levels will be developed and included in the Record of Decision (ROD). Like the LDW FS and ROD, tissue PRGs will not be developed or included. EWG expects the target levels to be the same as in the LDW ROD. Tissue monitoring is included for the FS alternatives.
194	Table 4-4	4-26	Remove the abbreviation note for "nc" as it is not used in the table.	Deleted.
195	Table 4-5	4-28	a) The frequency of detected concentrations above SQS (last column) for 2,4-dimethylphenol needs to be revised to 0.4 (not 0). b) Remove the abbreviation notes for abbreviations not used in the table (e.g. DDT, EF, ne)	Revisions made.

Section 5

Comment #	Section #	Page #	Comment	Draft Response
196	5.1	5-3	Paragraph 2: Indicate whether high flow periods could be part of observed episodic mixing.	No change was made. Comment has already been addressed in the last paragraph of this section. High flow periods are not predicted to result in scour.
197	5.1	5-3	Paragraph 2: Explain why only areas near the pier edge should be subjected to prop wash erosion. What does the Cs-137 peak relative to core location indicate in this regard? (It isn't possible to see where the cores were taken in relation to the pier edge).	Text was modified in Section 5.1 to clarify—the word "also" was added so as not to imply only pier edge. Propwash erosion is predicted away from the pier edge, both in open water and the underpier areas, consistent with cesium-137 (Cs-137) peak data and the figures presented in this section. Figure 5-1 shows the core locations relative to the pier edge.
198	5.1.2	5-6	In footnote 48, indicate how many cores were not analyzed (and instead were archived).	The text was modified in the footnote per this comment.
199	5.1.2	5-7	In the second paragraph, the third bullet indicates that areas that had no cesium peak were assigned a net sed. rate based on the lead data. In addition, the fourth bullet states that operational areas that included no cores (areas that had been previously dredged) "were assigned one of the representative net sed. rates based on adjacent areas." This statement needs some clarification. Specifically, it appears from review of Figure 5-1 that the closest Cs-based data were used to assign a net sed. rate for each area that did not have a core, even if there was closer Pb-based data. For example, area 1A-2 has an adjacent area (1A-3) where the core provided a Pb-based sed. rate but no Cs-based rate. The authors did not use this adjacent core Pb-based rate to represent 1A-2. Instead they appear to move upstream all the way to cell 5 where Cs-based rates are available. A similar process appears to have been used to develop sedimentation rates for cells 1C and 2. Ensure that the text on page 5-7 accurately describes the methodology used to assign sedimentation rates, and provide further justification on the use of more distant Cs-based data over nearer Pb-based data. A solid justification is important on this issue because the general data trend indicates a lower sedimentation rate in the north compared to the south. As described on page 5-3, the cores in the north did not have clear Cs peaks and the Pb-based data indicates a rate of 0.5 cm/yr. It appears that the sedimentation rates used in operational areas 1A-2, 1C, 2, and even 1B-1 would be better represented by a rate of 0.5 cm/yr. These changes need to be made, and modeling implications discussed with EPA.	Comment discussed in Comment Resolution Meeting #1 on June 12, 2017. Per the discussion in that meeting, text clarified that Cs cores were the primary data source for net sedimentation rates. Table 5-1 was updated to clarify the rationale for the sedimentation rates assigned to each area. Note that this approach was also discussed in WPAM #2 on September 15, 2015.
200	Table 5-1 (& Figure 5-1)	5-9	During past meetings there was much discussion between EWG and EPA about net sedimentation rate during which a consensus was eventually reached on what values were appropriate for the FS. EPA is not challenging the final decision on the sed. rate, but the data presented in the FS must support the final agreed-upon value in a logical manner. The following comments include some editorial changes, along with a few more significant observations that require further explanation to provide a logical argument. a) Replace the column for "Geochronology Cores Located in Area", with a column for "Geo. Cores used to Determine Rate in this Area." This would allow the reader to see all the data that went into the rate calculation for that area. This would also more clearly explain what cores were used for areas that don't have cores, and areas where cores from adjacent areas are also used with cores in that area. This revision may resolve some of the following comments. b) For Area 1A-2, the rate was based on cores in "Areas 1A-1 and Area 5," however there is no core located in 1A-1, and Area 5 is quite far away. Provide further justification as to why the cores in Area 5 were preferred over core GC-08 in Area 1A-3 which is significantly closer to Area 1A-2. c) For Area 1A-3, the Pb-210 high-end rate was given as 0.49, however in SRI Table 3-3 is given as 0.48. This needs to be corrected. d) For Area 1A-6, core GC-09 was listed as within that area (third column), however it is not. In the description of the Basis, GC-09 is described as part of Area 3, which concurs with Figure 5-1. Revise for accuracy. e) For Area 1A-6, the basis for the rate is described as "Pb-210 data from GC-09". In SRI Table 3-3, the Pb-210-based sedimentation range for GC-09 is listed as 0.35-1.4 with a best estimate of 0.56. The final sed. rate chosen in the FS was 1.6, which does not follow directly from the data for core GC-09. Provide further explanation as to how 1.6 was chosen. f) For Area 1B-1 in the Basis description, core GC-09 is described as being in Area 1A-6, but it is located in Area 3. Correct for accuracy. g) For Area 1B-1, nearby cores GC-09 and GC-12 were used. From Figure 5-1, a reader would also see that core	Comment discussed in Comment Resolution Meeting #1 on June 12, 2017. Per the discussion in that meeting, text clarified that Cs cores were the primary data source for net sedimentation rates. Table 5-1 has been modified per comment. a) Column not added because the sedimentation rate is based on discrete averages (i.e., 0, 0.5, or 1.6) instead of individual cores. The "Basis" column has been heavily edited to address the comment. b) Additional justification added to the Basis column. c) Corrected. d) Corrected. e) Additional justification added to the Basis column. f) Corrected. g) Additional justification added to the Basis column. h) Additional justification added to the Basis column. i) Corrected. j) All core data added. k) Additional justification added to the Basis column. l) Corrected. m) Corrected. n) Table updated with best estimate, low, and high values for Cs-137 and lead-210 (Pb-210). o) Additional justification added to the Basis column.

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			GC-08 is nearby. Provide an explanation as to why this core was not also used. h) For Area 1C, the Basis description indicates cores from Area 1B-1 were used, however there are no (non-archived) cores in Area 1B-1. Correct which core is being used for the basis; it appears core GC-05 in area 1B-2 is nearest. i) For Area 3, GC-09 needs to be added as a core in this area. j) For areas with multiple cores, show the Cs/Pb data for each of the cores. If, as suggested in comment (a), the cores listed are the ones used to calculate the net sed. rate, adding all the core data will help the reader understand all the data that supports the final rate assigned. Add all core data as appropriate. k) For Area 4A, the Basis description indicates that data from adjacent areas suggest that a higher rate (1.6) is more appropriate than the data from Area 4a itself would indicate (0.5). Further justification as to why the core in Area 4A is not appropriately representative needs to be provided. l) For Area 4B, core GC-16 is listed as in this area, but it needs to be core GC-15 m) For Area 5, core GC-15 is listed as in this area, but it needs to be core GC-14. n) For Area 6, the Cs-137 low-end value is listed as 1. However, in SRI Table 3-3 for the two cores in the area, it is listed as 1.8 and 'uninterpretable'. Either revise or provide justification for why 1 was chosen for this table. o) For Area 7, the Basis for the sed. rate of 1.6 was given as data from core GC-19A (in Area 7) and cores in Area 6. However, Area 6 was determined to have a sedimentation rate of 0.5, so this doesn't support the rate determined for Area 7. Revise the Basis for the sed. rate for Area 7 as appropriate	
201	Table 5-2	5-13	The "vessel operating areas" listed in the first column do not match up with the area labels used in Figure 5-1 (and other figures). Revise this column to be consistent with the figures, or at least include a new column so it is easier to understand how the different labels relate to each other.	Table modified per comment.
202	Table 5-2	5-13	Based on STER Table 5-4, revise the max near-bed velocity for Area 1C: "~~2~~3.0"	Table updated to match Sediment Transport Evaluation Report (STER) Table 5-4; Area 1C: 3 ft/s.
203	Table 5-2	5-13	Based on STER Table 5-4, revise the max bed shear stress for Area 4A (existing): "~~(2.0 Pa) 0.03 (2)~~".	Table modified per comment.
204	Table 5-2	5-13	For the row "Area 4 (future operations)" remove the "future conditions" from columns 3 and 4; it is unnecessary given that this is indicated in the first column.	Table modified per comment.
205	Table 5-2	5-13	Correct the typo in footnote 1: "…can be found in Section 5.1.2 and Table 5-~~12~~ of the EW STER…"	Table modified per comment.
206	5.2	5-14	Clarify in this section that the RMC will be placed over the entire area (as is indicated in Appdx B and Appdx J), not just dredging areas.	Text clarified per comment.
207	5.3.1	5-17	Section 2.11.3.2 notes seeps as a possible lateral source of COCs. Explain why seeps are not addressed here. Also explain the contribution of lateral sources from erosion of underpier sediments by scour.	The text was modified per this comment. Text was added to Section 5.3.1 explaining why seeps have not been included, with reference to Section 2.11.3. Underpier sediment scour is already outlined in Section 5.3.4 "Exchange of Open-water and Underpier Sediments" so is therefore not discussed in Section 5.3.1, which is upstream and lateral sources. Laterals (i.e., stormwater and CSOs) contribute to both open-water and underpier deposition and then redistribution of sediment occurs due to vessel scour.
208	5.3.1	5-17	In the first paragraph on this page, it is stated that bounding values were available for LDW lateral sources, however in Table 5-3 no lateral bounding information is provided. Revise either the paragraph or table as needed.	The text was modified per this comment.
209	5.3.4	5-26	Paragraph 2: The figure estimate doesn't include the lateral distance and depth of disturbance (i.e., volume of sediments). Add this information.	The text was modified in the footnote per this comment.
210	5.3.5	5-27	It is not clear what this 90% figure represents – reductions observed in other studies? Provide a reference for this value.	Reference to Section 7.2.7.1 was added.
211	5.3.4	5-27	First full sentence "…the results of the box model evaluation were determined through a sensitivity analysis described in 2.4 of Appendix J". EPA could not find a section 2.4 to Appendix J. Clarify the reference	Reference was updated to Appendix J, Section 2.3.2.
212	5.3.6	5-30	The last sentence of Section 5.3.6 references Appendix B Part 2 for the SWACs; Appendix B Part 2 is the scour depth analysis. Correct the reference.	The text was modified per this comment to reference Appendix J, Section 2.
213	5.3.7	5-30	Define a SWAC and how it is applied to the EW FS in this section.	Footnote added to Section 5.3 to address comment. Text also added to the first paragraph of Section 5.3.6 for clarity. References made to Section 4 PRGs for further clarity.

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214	5.3.8	5-30	In the last full sentence of the page, the text discusses the same Alternative 2B(12) as having either ENR and in situ treatment for underpier areas. Explain further what this means and the difference between ENR and in-situ.	Typo corrected; MNR is used in Alternative 1A(12). Sentence added to explain why two alternatives were selected with a reference to Sections 7 and 8 for a full description of the technologies and alternatives.
215	5.4.2	5-34	In the last paragraph "Appendix B, Part 5 provides a detailed discussion of how chemistry assumptions used for the recontamination potential evaluation for upstream and EW lateral sources were developed." It does not appear that Part 5 includes a discussion of EW lateral loads. Clarify the reference.	Reference updated to Appendix B, Part 4.
216	Table 5-6 & Table 5-7	5-35 & 5-37	For the LDW Laterals rows, it is confusing to have the low and high bounding values be the same range, particularly given the low end of the range is actually "n/a". Either revise to a single value, or provide an explanation in the footnotes.	Revised to a single value to be consistent with what was modeled.
217	5.6.3	5-45	As mentioned in Section 2.11.3.2, underpier sources, i.e., seeps, sheet flow, etc., extend the area of concern to the entire boundary of the EW Operable Unit, and are not restricted to the SO only. Potential loading needs to be estimated for the entire upland OU that drains into the EW.	Comment discussed in Comment Resolution Meeting #4 on July 11, 2017. Per the discussion, "Areas of concern for recontamination" were modified to "areas of potential recontamination" for clarity. For clarification, the area of concern has been delineated based on the area with sediment within the Study Area boundary. Areas with riprap only have been excluded because they do not contribute to site risks. The area with sediment will be re-evaluated during design. Loading estimates from lateral loads are based on loading from the entire catchment areas associated with City, County, and Port outfalls. Based on site information, seeps and sheetflow are minor contributions compared to lateral storm drains and CSOs and, therefore, are not modeled. These pathways will be assessed further during the design phase and through source control actions.
218	Figure 5-2		Scour boundaries shown in the Figure 5-2 do not appear limited in extent toward shore where piers exist and access by prop scour would abate. Data has shown that underpier sediments are stable, thus not scoured. Add this information to the discussion.	No change was made. Underpier sediments are not considered stable, as discussed in Section 5.3.4 "Exchange of Open-water and Underpier Sediments." This model parameter accounts for the resuspension of material and exchange between the main waterway and the underpier area.
219	Figure 5-1		Either remove the cores that were archived, or indicate them with a different symbology. It is misleading to list them with the "Geochron Core with Net Sedimentation Rate" when they are not being evaluated for sedimentation rates.	Figure revised per comment.
220	Figure 5-2		Note 1 references "Attachment 4 of Appendix F". This appears to be an error as Appendix F does not contain attachments. It seems likely this reference should be for "Appendix B Part 2". Revise as appropriate.	Figure revised per comment.
221	Figure 5-2		Note 3 describes that the inner areas are expected to "experience similar scour depths as the berthing areas". Currently these inner areas are shaded grey which makes it visually appear that there is no data or no scour is expected. Instead, it would be more appropriate to include a colored hashed/striped symbology, to indicate that some scour is expected but it is uncertain how much. Revise.	Figure revised per comment. Figure 5-2 updated to include orange/grey stripes in Area 1B-1 and red/grey stripes in Area 1B-2.

Section 6

Comment #	Section #	Page #	Comment	Draft Response
222	6.1.1	6-3	In the second paragraph, the data used to establish the area of remediation for north of the Spokane Street Bridge is described. But it does not describe what data was used under and south of the bridge for remedial decisions. Add this data/information.	The text states that the entire EW OU surface data were used. The text was revised to clarify that north of Spokane Street Bridge also includes 0- to 2-foot subsurface data.
223	6.1.2.1	6-4	It needs to be clarified here that the remediation area is for point based compliance and that the approach for developing compliance on an area basis is provided in Section 6.2.2. In determining whether the RAO is met, two approaches need to be discussed in this section: 1. If the PRG is based on risk and the SWAC is less than the PRG. This approach still has issues in that the SWAC will meet the PRG but the 95% UCL on the mean will potentially result in failure to satisfy the RAO. 2. If a group comparison test indicates that site and background distributions are not significantly different. It is unclear as to how to incorporate use of Thiessen polygons into a group comparison test.	As discussed in Comment Resolution Meeting #2 on June 15, 2017, text and footnote were added to Section 6.1 for clarity.
224	6.1.2.1	6-4 to 6-5	In the last paragraph (going onto the next page) it is described that Thiessen polygons were derived first from surface (0-10 cm) samples, and then shallow subsurface (0-2 ft) samples were added and new polygons were generated. a) In Figure 6-1, footnote 2 indicates that only some shallow subsurface samples were included, which is not consistent with the description in the text. This description must be added to the text and further developed to fully describe which data were and were not included. Also, explain why polygons were redrawn for some of the added subsurface data but not for all of them (i.e. Figure 6-1 shows some polygons with multiple data points). b) It is noted in Appendix H (pg. 5) that seven shallow subsurface cores were not included in the development of remediation areas because surface sediment concentration data were below RALs or toxicity testing passed. Excluding these cores leads to cores with surface sediment >RAL remaining in unremediated areas, which is very concerning especially given the extensive mixing which is assumed in the upper interval. The justification for not including these cores needs to be included here in Section 6 and greatly expanded upon to explain why the surface data is more representative than the shallow subsurface data particularly given the deeper mixing expected. For example, when using the justification that the surface data passed toxicity tests, if the shallow subsurface data also passed toxicity tests, or at least had similar chemistry, then excluding the subsurface may be appropriate. But, if the shallow subsurface did not pass toxicity, or if the chemistry is different, then exclusion may not be appropriate. Add this information. c) Based on Figure 6-1, it appears several shallow subsurface core data were not included (e.g. S19, S14, S9, S02, S10, etc.) which also don't correspond to the seven excluded cores described in Appendix H. Ensure the expanded description of what data was included/excluded in the Thiessen polygon development includes these (and all other excluded) cores.	a) Section 6.1.2.1 text revised for clarity. b) Text was added for clarity—the surface sediment data and the subsurface sediment data were used to determine a best estimate for the area requiring remediation. The remediation area will be refined in design. c) Text clarified that 0- to 3-foot intervals were not included because they may be indicative of contamination below 2 feet (sediment shallower than 2 feet is used to determine remediation in these locations). Cores with surface intervals larger than 3 feet tend to be present in the Shallow Main Body – North area, which also has a shallower mixing depth than other parts of the Deep Main Body and berthing areas. The remedial footprint will be refined during design.
225	6.1.2.2	6-5	It is stated: "Other intertidal areas that are entirely riprap or are not exposed because they are beneath an overwater apron or pier are not included in the intertidal area evaluated for RAO 2 (see Figure 2-11)." Describe the potential for these areas to have concentrations above PRGs and to recontaminate the site post cleanup.	Text was added to indicate that these riprap areas do not have sediment. The influence of underpier sediment on clamming areas is part of the box model because underpier exchange is a parameter in this model.
226	6.1.2.2	6-5	This section describes the method used to merge the composite samples collected from the intertidal areas with the Thiessen polygon interpolation for the subtidal areas. Arsenic and cPAH are the only COCs mentioned. In Section 3.2.2 (Table 3-6) PCBs and dioxins are also mentioned as potential risk drivers for dermal contact (RAO 2). It is unclear from the text, so an explanation is needed as to whether dioxin and PCB concentrations interpolated into the intertidal areas use the same methodology used for arsenic and cPAH.	Section 3.2.5 describes the decision process for identifying risk drivers from the COCs. Dioxin and PCBs are not mentioned in Section 6.1.2.2 because they are not risk drivers for intertidal clamming. No change necessary.

Comment #	Section #	Page #	Comment	Draft Response
227	6.1.3.1	6-6	The FS baseline data set is missing at least one important set of data collected in April 2013 from underneath and adjacent to the Coast Guard Pier 36. The omission of this data is significant since the surface sediments sampled in this area have (among other contaminants) cPAH and total PAH concentrations that are the highest observed in the East Waterway OU. While inclusion of this data will not change the overall alternatives analysis, it will require modifications to be made to several of the figures representing areas exceeding SQS (Figure 6-1), dioxin/furan RAL (Figure 6-4), cPAH RAL (Figure 6-5) and areas requiring remediation (Figure 6-7). The text in this section (page 6-6) indicates that the FS baseline dataset represents samples (surface and subsurface) collected between 1991 and 2010 yet it also states that 80% of the data has been collected within the last 8 years. While EPA is arguing (above) for the inclusion of a more recent data, it is unclear if the FS baseline data in its current form even includes information from 2008 – 2016.	As discussed in Comment Resolution Meeting #1 on June 12, 2017, USCG data added. No other data were added since the EW SRI sediment investigations.
228	6.2.1	6-9	LAET has been defined in previous table notes but further description and application here is needed.	Footnote added per comment.
229	6.2.1	6-9	In the first paragraph of this section, SQS benthic criteria are used to evaluate exceedances in the top 10 cm of the sediment. In the second paragraph, TBT exceedances are evaluated in the top 0-2 ft. Explain if evaluating the SQS criteria in the top 0-2 ft of sediment would change the area of exceedance.	The text was modified to address this comment. All chemicals were evaluated against SQS and the TBT RBTC in the surface and 0- to 2-foot intervals for purposes of setting the remediation footprint; compliance will be assessed using surface sediment (0 to 10 cm), which is the biologically active zone (BAZ).
230	6.2.1	6-10	Although SQS values were exceeded for 29 benthic risk driver COCs, the FS proposes to develop RALs for a subset of nine "indicator SMS chemicals" because "site-specific analysis shows that remediation to address these nine contaminants also addresses the other SMS contaminants that are above the SQS because the COCs are co-located." Provide more detail on this site-specific analysis to justify eliminating RALs for the other 20 SMS contaminants. Explain if the absence of RALs for these chemicals have any potential ramifications for long-term monitoring and future decisions regarding achieving RAOs.	Additional text was added for clarity. The analysis is just a simple database query to show that once the remediation footprint is developed using the nine indicator COCs, then no more SQS exceedances remain outside of the remediation footprint. The text indicates that all SQS COCs will be analyzed in design and monitored in the long term; therefore, the selection of these indicator compounds does not have ramifications for future monitoring or decision-making.
231	6.2.1	6-10	This section never explicitly states that the RALs are being set equal to the SMS. It is implied in previous sections, but given this is the section a reader would reference to find out how RALs were set, it needs to be very clear here.	First sentence of this section revised for clarity.
232	6.2.2	6-11	Provide more justification on how the Remedial Action Levels were selected. It would seem that consideration of PCBs coming in laterally and from upriver would be of key concern.	Text was added per comment and discussion in Comment Resolution Meeting #3 on July 6, 2017. Text was added to Section 6.2.2 referencing net incoming concentrations, which are shown in Figure 6-2 but were not discussed in the text.
233	6.2.3	6-13	Explain if potential recontamination of intertidal areas from subtidal areas was considered.	No change was made to this section, as recontamination potential was not explicitly evaluated as part of the RAL development. However, net incoming sediment concentrations are included in Figure 6-2 as a general check for recontamination potential for the selected RALs. Moreover, recontamination potential is an important part of the alternatives modeling and evaluations.
234	Figure 6-1	6-15	Hash mark pattern for dock/pier in legend doesn't match figure; should slant forward. Correct this discrepancy.	Corrected.
235	Figure 6-3	6-17	This figure combines the RAL exceedances for surface and subsurface sediment. Revise/add figure to indicate separate exceedances so the potential remediation areas are more clearly defined (i.e., clean surface over contaminated subsurface would not require remediation).	Change not made. The figure shows the entire required remediation area. The comment is addressed in Appendix H, which provides a detailed depiction of subsurface sediment. In response to the statement that "i.e., clean surface over contaminated subsurface would not require remediation," all subsurface samples from 0 to 2 feet are considered. Thus, even if there is a surface sample that is below the RALs above a core with a 0- to 2-foot interval above the RALs, that area is included in the remediation footprint.

Section 7

Comment #	Section #	Page #	Comment	Draft Response
236	Ch 7	General	Caps in intertidal areas and areas with suitable clam and/or geoduck habitat must be of sufficient depth to provide clean, suitable substrate for the clams to live in.	Additional text was added to explicitly address intertidal cap habitat design requirements (i.e., clamming) in Section 7.2.5.1. The FS does not contain alternatives that contain subtidal caps within areas where geoducks were encountered in the EW.
237	7.2.4 & Table 7-2	7-16 & 7-52	Text states that ENR placement in underpier areas would be difficult and ineffectual because of steep side slopes. While the slopes under some piers in the East Waterway are steep, there are other areas (e.g., within Slip 36) where this is not the case. Furthermore, thin-layer capping of underpier areas (akin to ENR) has been demonstrated to be an effective means of blocking exposure to underpier contamination in nearby areas such as the Todd Shipyard. Given the access and safety issues associated with hydraulic dredging under piers and the costs/logistical obstacles to pier demolition, it is important to keep options such as underpier ENR on the table particularly for areas with surface sediment contamination that is well in excess of RALs and for which MNR or in-situ treatment may not be options.	Port underpier areas have a slope of 1.75H:1V, which is too steep to place ENR material, impacting the stability of the ENR material. ENR and capping has been retained for small underpier areas (Slip 36), where slopes are 2H:1V. However, no change to the alternatives was made because of the small area affected. ENR could be reconsidered during remedial design. Text was revised in Section 7.8.2 to indicate that capping and ENR could be selected during remedial design.
238	7.2.4	7-17	1st Bullet: Explain the technical basis for the 9" cap thickness - i.e., does the steady state value at the sediment water interface meet PRGs.	Statement added after bullets to clarify that ENR is a mixing layer, and therefore steady state value is not relevant as for a capping analysis. This text refers to ENR, not thin layer capping. The technical basis is experience at other cleanup sites: "this is consistent with typical thickness assumptions at other sites, and the hydrodynamics and operational considerations of the Sill Reach."
239	7.2.4	7-17	2nd Bullet: Same comment as above; 15" may address scour depth but explain if it controls chemical migration.	Statement added after bullets to clarify that ENR is a mixing layer, and therefore steady state value is not relevant as for a capping analysis. This text refers to ENR, not thin layer capping. The technical basis is "to decrease the contribution of shallow subsurface contamination on concentrations in the biologically active zone in areas anticipated to have deep sediment mixing." Note that modeling assumes mixing with underlying sediment, so the effectiveness evaluation incorporates the effect of ENR mixing.
240	7.2.5	7-18	Paragraph 1: This entire section doesn't appear to address reactive mat capping, only the placement of loose materials. Add or indicate why it is not applicable.	Clarification added to mention reactive mat capping in paragraph on reactive capping. Reactive mat caps may be considered during remedial design.
241	7.2.5.1	7-19	Add mention of ground water vertical migration which has a very significant effect on the cap design	Text was added per comment.
242	7.2.5.2	7-20	Paragraph 2: Add mention of reactive cap mats, i.e., CETCO, that are designed to work on steep slopes.	Clarification added to indicate the placement of reactive caps can be designed for steep slopes but require additional engineering considerations if placed in underpier areas.
243	7.2.5.3	7-21	Note that depth of over-dredging to accommodate the necessary cap thickness would also depend on the residual un-dredged COC concentration, which would provide the new contaminant source loading the overlying cap.	Text was added to indicate that the cap design will consider cap thickness requirements listed in Section 7.2.5.1, which includes contaminant transport analysis of the concentrations of underlying sediment.
244	7.2.5.4	7-22	1st paragraph: Add the following considerations to this section: a) "Because capping disturbs relatively little in situ contaminated sediment." Is not necessarily true and is operator-dependent (among other factors). b) Capping where predredging might be required for no net loss of navigation depth is a significant source of disturbance. c) Capping may also require a habitat enhancement layer to accelerate recolonization of benthic community. d) Placement of cap material as overburden may have the effect of compressing underlying sediment layers and "squeeze" porewater from depth into the overlying cap and water column.	Text was added to address each comment as follows: a) Statement added to clarify that it is in comparison to dredging. b) Statement added that partial dredging and capping result in additional disturbance. c) Text was added to note the habitat enhancement layer. d) The potential for porewater migration during compaction is mentioned in language added to Section 7.2.5.1 and is not particularly important to mention in this summary section, as the cap would be designed to account for this factor.
245	7.2.6	7-23	Add the following considerations to this section: a) Impacts on fish tissue concentrations can occur well downstream of the dredging action (e.g., GE Hudson). b) Turbidity plume control may still be required but difficult to implement in the deep and high current EW waters.	Text was added per comment. Turbidity plume control is discussed in Section 7.5.3 and referred to in this section. See also discussion in Section 7.5.3.
246	7.2.6.1	7-23	Note that environmental buckets may be used to limit sediment resuspension during retrieval of sediment through the water column.	Text was added per comment.
247	7.2.6.1	7-24	Indicate that: a) Barge dewatering may be subject to treatment if concentrations are shown to exceed WQC. b) Positional control technology/differences of the fixed vs. cable arm methods should be discussed.	Text was added per comment. a) Treatment to meet water quality criteria (WQC) added. b) "Positional" control added to last paragraph of the section.

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248	7.2.6.3	7-26	As was discussed during WPAM #9, statistics on workplace accidents are not appropriate for the main body of FS. A general discussion of the high risk of diver-assisted dredging is fine, but specific OSHA statistics need to be removed.	As stated in WPAM #9 (August 9, 2016), EWG does not agree this worker safety information should be removed from Section 7. However, per EPA direction, the footnote with specific OSHA statistics was deleted. Note that additional text discussing site conditions related to diver-assisted hydraulic dredging has been added to Section 7.2.6.3 based on discussion with EPA regarding Comment 332.
249	7.2.6.5	7-27	Clarify that reducing the failure to delineate and dredge missed inventory must be addressed in the sampling conducted for the remedial design.	Text was added per comment.
250	7.2.6.5	7-28	Add notes that: a) Placement of the RMC may be subject to resuspension and uncontrolled dispersion. b) In addition to cost, the relatively coarse nature of the sediment would minimize dispersion during RMC placement.	Text was added to address resuspension of generated dredge residuals, which would occur during placement of residuals management cover (RMC), regardless of grain size.
251	7.2.7.1	7-30	Include a note that reactive material placement within geotextile layers, and with multiple reactive agents (i.e., apatite, AC, organoclay), has been successful.	Included reactive mat capping under in situ containment (capping). Text was added per comment to Section 7.2.5.1.
252	7.2.7.1	7-31	In Situ Treatment Effectiveness Assumptions: More discussion of the 70% reduction efficiency specifically for the EW site is needed, addressing the sediment COCs and concentrations involved and resulting biota tissue values.	The text was modified throughout this section to better justify selecting 70% reduction efficiency for the EW.
253	7.3.2	7-39	Correct the typo: "The Roosevelt Regional Landfill is operated by Allied Waste near ~~Goldendale~~ Roosevelt, Washington…"	The text was corrected per comment.
254	7.3.3	7-40	Discuss whether much of EW sediments qualify for beneficial uses\daily landfill cover. Also discuss whether there are opportunities to use dredged sediments as possible base material for wetlands creation.	Text in Section 7.3.3 was clarified that no EW sediments that are removed as part of the sediment cleanup are expected to be below criteria that would allow beneficial reuse as fill material, unless treated. As indicated in text added to Section 7.3.2, while some landfills do use sediment as daily landfill cover, this is not counted as a beneficial use for the purposes of the alternatives evaluation. That sediment is still required to be disposed of at a landfill, and it is the landfill that manages use of the sediment at the landfill.
255	7.6	7-51	Consistent with Comment #10, this section and Table 7-2 need to clarify that the "authorized navigation depth" will be the future anticipated depth following the Seattle Harbor deepening project.	Consistent with the response to Comment 10, the buffer requirement for the SHNIP is not used because the project is uncertain at this time. Explanatory notes added to Section 7.2.5.3 and Table 7-2.
256	Table 7-3	7-54	This table is missing the T-25 Nearshore CMA. Add this information.	Table revised to include T-25 nearshore.
257	7.8.2	7-62,63	Consistent with Comment #237, revise to include ENR as a possible remedial technology subject to considerations of access and underpier slope.	Text was added per comment.
258	7.8.2	7-62	Second paragraph: Text states that "…underpier areas have high recovery potential following the remediation of adjacent open-water areas because of sediment exchange between these areas." However, to the extent that surface and subsurface sediments in underpier areas contain historic contamination from activities associated with the adjacent shoreline, they may also be a source of continuing recontamination to the remediated open-water areas. Add text to this section acknowledging this alternative view on the recovery potential and influence of underpier areas.	Text was added per comment. Exchange of underpier sediments into open-water areas is part of the predictive modeling.
259	7.8.2	7-62	Last paragraph on page: The list of dredging-specific action levels to trigger limited underpier sediment removal must also include action levels for cPAHs, dioxin, and TBT since particularly high concentrations of these contaminants have been found in underpier areas.	No additional action levels are developed, consistent with Comment Resolution Meeting #4 on July 11, 2017. The PCBs dredging-specific action level was developed to evaluate the potential reduction in site-wide risk from additional mass removal of PCBs under the pier. The mercury dredging-specific action level was developed to evaluate the potential reduction in benthic risks from additional mass removal of mercury under the pier. Dredging-specific action levels were not developed for other human health risk drivers because they either achieved all PRGs following construction without any additional dredging action level (i.e., cPAHs and arsenic), or because they contributed significantly less than PCBs to site-wide risks (dioxins/furans). Dredging-specific action levels were not developed for TBT because PCBs and mercury had the largest percentage of exceedances in the EW and, therefore, contributed the most to the benthic risks in the EW. The effectiveness of the dredging-specific action levels is assessed by comparing the predicted alternative outcomes in Section 10.
260	7.8.2	7-63	Last paragraph: Explain if a reactive mat cap may be a viable technology here.	Text was added per comment to clarify that ENR and capping may be considered during remedial design (including reactive mat caps). However, reactive mat capping is not expected to be viable in

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				most underpier areas due to obstructions such as piles, access limitations, and stability on steep slopes (i.e., anchoring).
261	7.8.4	7-65 & 7-66	The summary for the Sill Reach indicates that in situ was eliminated, however in the last paragraph it is stated that in situ was retained. Revise this section for consistency regarding the utility of in situ in the Sill Reach and also to ensure consistency with this section and Table 7-4..	Text revised in the first paragraph of the section for consistency.
262	7.8.8	7-69	In the third paragraph it is stated that ENR was retained in conjunction with partial removal in this CMA to gain appropriate clearance for future navigation activities. Explain what this means. Also explain if future navigation activities include the proposed deepening of the navigation channel.	Text revised for clarity. Text was added to Section 7.2.5.3 that the FS is designed to accommodate current authorized depths and be compatible with future deepening.

Section 8

Comment #	Section #	Page #	Comment	Draft Response
263	8.1.1.2	8-3	Explain what observations of debris have been made for under pier areas.	Text was added per comment. Significant debris has been observed during maintenance dredging next to piers (e.g., at T-18). Diver observations regarding debris have not been recorded in underpier areas during previous surveys.
264	8.1.1.2	8-3	Explain if there any concern over pier stability by dredging too close to the pier.	Text was added per comment. Offsets from structures will be considered.
265	8.1.1.3	8-3	Additional issues surround barge filling and transport may include odor, noise, navigation restrictions, and many others, and these need to be addressed in this section.	Text was added per comment.
266	8.1.1.4	8-4	Sediment effluents will contain PCBs. Explain what will occur should a release of PCBs to the water body occur. Other sites regulated under NPDES agreements have not allowed any releases. Not allowing barge dewatering at the dredge site would significantly impact production. Add a discussion of this issue to this section.	Text was added per comment.
267	8.1.1.5	8-5	These predictions have changed/accelerated over the last decade - update the projections if possible to reflect more recent information. Area/viability of mudflats for clamming will be greatly affected by sea level rise and thus will not affect all alternatives equally. Add this to the discussion.	Predictions have been updated. The alternatives would all be affected equally because they all have the similar remedies in potential clamming areas that would provide the same post-construction elevation targets (i.e., a large sea level rise would affect all alternatives similarly).
268	8.1.1.6	8-5	Summarize what the neatline dredge depths are for each area. Explain the uncertainty (e.g., 95th percentile of depth range) allowed to address minimization of missed inventory.	Reference to Appendix F revised to include dredge depths for specific areas. As discussed in Appendix F, a volume factor was used to address missed inventory.
269	8.1.1.6	8-6	Paragraph 1: Explain what the assumed neat line depth of contaminated sediments in intertidal areas is.	No change was made to Section 8. Appendix F presents the dredge depths by location.
270	8.1.1.6	8-6	Paragraph 2: The TIN is not a constructible boundary; some methods of smoothing/averaging are going to be required. State this here.	Text updated. The second paragraph already addresses the constructability factor used to estimate the volume required to make the triangular irregular network (TIN) a constructible surface.
271	8.1.1.6	8-6	Paragraph 3: Dredging only to 5 ft for cap placement may not allow for an over dredge allowance. Discuss this.	Five feet is the neatline volume, and a factor was added to account for overdredge. Text clarified.
272	8.1.1.6	8-6	Paragraph 4: Existing bathymetry already shows a depression where the cable crosses the EW, such that pre-dredging may not be required. A sub-bottom sonar survey of the cable areas as well as the toe of slope for riprap areas may be needed to determine current burial depth. Discuss this in this section.	Text clarified that additional analysis will be required during remedial design. Partial dredging and capping is not proposed in this area, but partial dredging and ENR-nav is (for Alternatives 1(A)12, 1B(12), and 1C+(12)).
273	8.1.1.6	8-6	Paragraph 5: These jet probe data have not been previously mentioned. Discuss the study and results in an appendix, and summarize here. Revise "and jet probe data" to state "using jet probe data".	Text revised to include citation of Sunchasers' jet probe surveys at Terminals 18, 25, and 30 in 1998 and 2000 where the results are discussed. Also, text was added to Appendix F (Section 2.2.2), to describe and cite the jet probe data.
274	8.1.1.6	8-6	Paragraph 5: How was it determined if riprap contained soft sediments or not? If present, hydraulic dredging would remove sediments and would be a significant volume when extrapolated over the entire site.	Text revised to describe how diver surveys were used to estimate area and depth of soft sediment.
275	8.1.1.6	8-6	Last paragraph: The estimates of underpier area that exceeds RALs need to be recalculated after inclusion of the Coast Guard Pier 36 surface sediment data. While the number of Thiessen polygons that will change is very small, it is nevertheless important that the figures (and estimates based on these figures) reflect the best available information.	Remediation areas have been revised in FS Section 6 and in FS Section 8 figures in consideration of new Coast Guard Pier 36 data.
276	8.1.1.7	8-7	Paragraph 1: Explain the technical basis for assuming 9" of residual management cover.	Technical basis added with reference to Appendix B, Part 5.
277	8.1.1.7	8-7	Paragraph 1: Indicate that the backfill volume is the same as the in-place dredging volume, less bulking factor.	No change was made. A bulking factor was not part of this calculation.
278	8.1.1.7	8-7	Paragraph 1: Explain if dredging adjacent to a cable line would not be allowed over concerns of destabilization (same as for toe of slope for riprap areas).	Cable crossing added to the text that addresses this comment in Section 8.1.2.1.
279	8.1.1.7	8-7	Paragraph 1: Clarify that 18 inches is the expected maximum depth of prop wash scour.	No change was made. The 18-inch layer is designed to mix and does not represent the maximum depth of propwash scour. Text clarified in the description of ENR in Section 7.2.4.
280	8.1.1.7	8-8	If the BAZ is 10 cm, explain why a 3" cap is considered protective.	Text clarified that this is consistent with recent case study. Activated carbon is expected to move into sediments below to bind hydrophobic organic contaminants and is not intended to perform as a cap.
281	8.1.1.8	8-8	Clarify that the fish window applies to the EW OU.	Fish window text clarified with EPA input.
282	8.1.1.8	8-8	This is the first use of the construction windows concept; explain why this time restriction is being applied. Also explain if some areas such as slips will be partially exempt (activity specific) if area use for fish migration/spawning could be prevented or assumed to be negligible.	Fish window text clarified with EPA input. It is unlikely agencies would exempt certain portions of the waterway from the fish window restrictions.
283	8.1.2.1	8-9	Mechanical Dredging: Indicate barge capacity, number of barges, and approximate turn-around time.	These details are not known at this time and depend on contractor decisions, but general information has been added.
284	8.1.2.1	8-10	Per previous comment, a sub-bottom survey indicating toe of slope location would help reduce this uncertainty. Add possibilities of this in this discussion.	Text was added that a sub-bottom survey may be employed during remedial design (Section 8.1.3).

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285	8.1.2.1	8-10	Diver-assisted Hydraulic Dredging Under Piers, paragraph 1: Note in this section that there are also significant mobilization costs, including separate safety plans and check-out dives to demonstrate competency and feasibility of technical approach.	Text was added per comment.
286	8.1.2.1	8-11	Paragraph 1: Note that the residuals include the undredged material not meeting RALs.	Text clarified that this discussion is specific to generated residuals. Undisturbed residuals (missed inventory) are assumed to be removed per text at end of this section.
287	8.1.2.1	8-11	Paragraph 2: Indicate that the actual RMC area will be determined by monitoring conducted during the post-dredging phase.	Text revised for clarity.
288	8.1.2.1	8-11	Paragraph 2: Note, in this section, that the RMC layer would act as a habitat enhancement layer.	Text was added per comment.
289	8.1.2.2	8-12	Paragraph 1: Note, in this section, that residuals management using RMC is unnecessary since a cap will be applied.	Text was added per comment.
290	8.1.2.3	8-13	Paragraph 1: See previous comment requesting explanation as to why 3" treatment with AC is sufficient (Comment #280).	Comment addressed in Section 8.1.1.7.
291	8.1.2.3	8-13	Paragraph 2: Quantify what % reduction was assumed for economy of scale.	Text was added per comment.
292	8.1.2.3	8-13	Paragraph 3: Specify total potential acreage of underpier areas.	Text was added per comment.
293	8.1.2.3	8-13	Paragraph 3: Indicate how this 2.3-ft average neatline depth is calculated (i.e. average of minimum and maximum depths).	Reference added to Appendix F where this is developed.
294	8.1.2.3	8-13	Paragraph 3: "…(costs…" Remove parenthesis and begin new sentence.	The text was modified per comment.
295	8.1.2.4	8-14	Restate that the allowance for overdredge may be required to ensure the underlying cap is not disturbed.	Text was added per comment.
296	8.1.2.5	8-15	State what the potential exchange rates are (e.g., cy/yr) and how they relate to contaminant concentrations over time – explain if this process of scouring/mixing will eventually dilute the under pier sediment concentrations.	Text was added with reference to Section 5.3.4 for further details on exchange rate estimates.
297	Table 8-1	8-22	a) In the top row, add a bullet/hyphen for each of the CMAs to differentiate them easier (vs. CMA names that cross onto a second line) b) The Junction Reach CMA is shown under both the Navigation Channel and Shallow Main Body areas. Remove the incorrect one. c) CMA T-25 Nearshore is missing from this table. Add where appropriate.	Table modified per comment.
298	Table 8-2	8-23	Explain why removal-only is satisfactory for PCBs, but PAHs need to be addressed by in situ treatment.	Footnote added to underpier dredging action level.
299	8.2.2 & Table 8-3	8-23, 8-24	a) Table 6-2 is referenced twice in this section (second sentence and Table 8-3), but Table 6-2 does not exist. Correct reference. b) Verify that the reference to Section 6.2.2 is accurate (seems that it should be Section 6.2).	Text revised. "Table 6-2" corrected to "Table 6-1" for both occurrences. "Section 6.2.2" corrected to "Section 6.2."
300	Table 8-5	8-26	a) Incorporate same comments for Table 8-1 (Comment #297). b) For the CMA list for the 'Sill Reach - Low Bridges', add the Railroad Bridge CMA. c) The sixth line of alternatives shows "2B(12)"; revise to be "3B(12)".	Table modified per comment.
301	8.2.5 to 8.2.13	8-27	The acres of "removal - open water" in these sections in Chapter 8 are not consistent with other places in the FS. It appears that some are rounded and some are adjusted to total to 157 acres. Revise so they are consistent.	Areas have been reviewed for consistency in the FS. Areas are consistently rounded to the closest acre such that the mapped areas add up to the total even if the rounded areas do not (e.g., 10.4 + 10.4 = 20.8 would look like 10 + 10 = 21, but is correct for these mapped areas).
302	8.2.9	8-33	Typo in the third paragraph: "The alternative has the same construction timeframe (≈10 years) as Alternative 2B(12)…"	Text revised per comment.

Section 9

Comment #	Section #	Page #	Comment	Draft Response
303	Ch 9	General	There needs to be more discussion about how alternatives utilizing active remediation will reduce contaminant concentrations more quickly and with greater certainty than those relying on natural recovery.	Additional language added to Section 10.2.1.1 for Alternative 1A(12) that MNR is more uncertain than active remedial technologies. Section 9.15.2 already states that the performance of MNR is less certain than other technologies. Note that only one alternative includes MNR (Alternative 1A(12)), and MNR is stated as the reason for higher residual risks in the long term and for longer time to achieve RAO 3 and child tribal reasonable maximum exposure (RME) risk.
304	9.1.1.2	9-5	First full paragraph of the page: Consistent with Comment #2 remove reference to complying with MTCA/SMS once regional background levels are established.	Text revised for consistency with Comment Resolution Meeting #1 on June 12, 2017. Regional background is retained as a possible way to comply with Model Toxics Control Act (MTCA)/SMS, but language was removed that the alternatives are expected to comply with regional background.
305	9.2.4.1	9-25	Surface sediment bullet: add that the 470 value is for total PCBs.	Text was added. SWAC for total PCBs revised to 460 µg/kg dw, per Section 2.
306	9.3.1	9-28	Percentage reductions in sediment contaminant concentrations must also be noted. This is particularly important because target risk based concentrations cannot be attained.	Per Comment Resolution Meeting #3 on July 6, 2017, percent reduction in total PCBs SWACs added.
307	Table 9-1	9-29	Include a note indicating that inputs from the LDW and lateral sources and migration of contaminants from under pier areas would likely be the cause of PCB and dioxin/furan concentration increases post-construction.	Note 3 added to Table 9-1. Also, new shading added to indicate achievement of PRGs, per Comment 308.
308	Table 9-2	9-30	As was done with Table 9-3, shade the cells that achieve the PRG.	Shading added to indicate achievement of PRGs to Tables 9-1 and 9-2 for consistency. Note 3 in Table 9-2 and Note 6 in Table 9-6a were added to indicate that the risk threshold is achieved while the PRG is not, due to the nature of how risks and PRGs are calculated.
309	9.3.1	9-33	Third dash on this page, revise to: "…SWACs for arsenic and cPAHs show a slight increase when comparing…" For arsenic the increase is nearly 3x, and for cPAHs it is 4-9x increase - these seem more than "slight."	Text revised per comment.
310	Table 9-4	9-36	Explain why only the baseline tissue UCLs on the concentration term are provided. Since the modeled concentrations are means, doesn't it make more sense for mean baseline data to be provided?	Consistent with the HHRA (Windward 2012b) and per previous EPA direction, UCLs are the selected statistic for baseline tissue concentrations. Added text to footnote 3 of Table 9-4.
311	9.3.3.1	9-38	Indicate the percentage reduction in risk, which appears to be significant. This is particularly important because target risks not be attained.	Per Comment Resolution Meeting #3 on July 6, 2017, percent reduction risks added. EWG selected total risks (PCBs and dioxins/furans combined) as the correct metric to add.
312	9.3.3.1	9-39	Add a footnote that briefly explains the difference between HQs and HIs, and what an acceptable HI vs HQ value is. Alternately, this could be included in the definitions section in Chapter 1.	Footnote added.
313	Table 9-5a	9-40	Include a note indicating that inputs from the LDW and lateral sources and migration of contaminants from under pier areas are the cause of lower initial child tribal RME cancer risks being lower than those associated with later time points.	Note 6 added to Table 9-5a.
314	9.3.3.2	9-44	The footnote indicates that post-remedy HQs were not calculated for direct exposure scenarios because baseline conditions were <1 (within the acceptable range). However, other influences (e.g. upstream sediment) could increase these values post construction, as was seen with the individual excess cancer risk (Table 9-6a). Provide further justification for why these HQs were not included.	Clarification added to footnote in Section 9.3.3.2 that post-remedy HQs would also be less than 1. Also note that modeling does not predict increases from baseline concentrations (only year 0 post-remedy concentration).
315	Table 9-6a	9-45	Include a note indicating that inputs from the LDW and lateral sources and migration of contaminants from under pier areas are the cause of increasing post-construction risks.	Note 5 added to Table 9-6a.
316	9.3.4	9-47	The second full paragraph (at the bottom of the page) describes why two TRVs are used. Move this to the beginning of the section to clarify this for the reader sooner.	Text moved to the beginning of this section.
317	Table 9-7	9-48	For the values listed as "<1.0", include the actual value (as was done for Table 9-5c).	Values not added because values equal to or less than 1 are considered non-hazardous, and therefore readers should not read differences into values equal to or less than 1. Tables 9-5c and 9-5d were revised in a similar fashion for consistency.
318	9.4.1	9-49	In the third paragraph, the references to Tables 9-1 and 9-2 seem incorrect. Appears it should reference Table 9-8. Verify and correct.	Reference modified per comment.
319	9.X.1 (X = 4-13)	9-49, 59, 72, 83, 95, 106, 118, 129, 138, 151	Identify the percent reduction in risk for seafood consumption. There will be a significant improvement, even if target risks cannot be attained.	Per Comment Resolution Meeting #3 on July 6, 2017, percent reduction in total PCBs SWACs added.
320	Table 9-8	9-54	Construction will take 9-13 years, depending on the alternative selected. Many evaluation metrics are achieved at time "0", which is immediately post-construction. The time to achieve evaluation metrics would, presumably,	Per Comment Resolution Meeting #3 on July 6, 2017, added footnote b to Table 9-8 identifying situations where the time to achieve the RAO is equal to the construction timeframe (i.e., year 0 post-

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			occur sometime during this construction. However, the table assumes that metrics will not be achieved until the end of construction. To the casual reader (who might skip the text and go straight to the Table), it therefore seems like longer construction period alternatives take longer to achieve these metrics than shorter construction period alternatives. This is somewhat misleading. It seems that a better way to describe "time to achieve metrics" can be devised so that it doesn't make it appear (in the table) that shorter construction period alternatives somehow achieve these metrics sooner than longer construction period alternatives.	construction). As discussed in the meeting, estimating the achievement of RAOs part way through construction is not possible for a variety of reasons and would be less certain (e.g., sequencing of subarea cleanups) compared to estimating it when all construction is complete, including dredge residuals management.
321	9.X.5.3 (X = 4-13)	9-56, etc.	In the paragraph following the bullets, indicate that the 7 mg/kg is for arsenic (arsenic is not mentioned until the end of the paragraph).	Text was added.
322	9.X.2 (X = 5-13)	9-60, etc.	Consistent with Comment #2, remove references to complying with MTCA/SMS once regional background is established.	Per discussion with EPA in Comment Resolution Meeting #1 on June 12, 2017, reference to expectation of meeting regional background is removed. However, regional background is retained as one potential method for achieving compliance with SMS.
323	Table 9-10	9-64	Indicate 'out of how many cores' for each table cell. Particularly since several of the zeros are actually zero out of zero.	Addition was made in Table 9-10. Table 10-1 was not revised in a similar fashion to preserve better readability.
324	Table 9-10	9-64	Based on the figures in Appendix H, several of these values seem incorrect. Verify and correct all values in the table. Below are a few discrepancies seen based on a spot-check: a) Partial dredging and capping, for 1A(12), 1B(12), and 1C+(12) [Figs. 2a/b/c], for >CSL: counted 9 not 8. b) Partial dredging and capping, for 1A(12), 1B(12), and 1C+(12) [Figs. 2a/c/b], for >RAL/SQS and <CSL: counted 7, not 13. c) No Action, for 2C+(7.5) [Figs. 5a/b/c] and 3E(7.5) [Figs. 6 a/b/c], for >CSL: counted 2 cores (S11 and S16), not 0. d) No Action, for 2C+(7.5) [Figs. 5a/b/c] and 3E(7.5) [Figs. 6 a/b/c], for >RAL/SQS and <CSL: counted 5 cores (S01, S20, S47, S13, S18), not 0. Update any related discussion of contamination remaining based on revisions to this table.	a) No change was made. For reference, the cores that fit the criteria are: EW10-SC08 D7 EW10-SC17 EW10-SC23 EW10-SC27 EW10-SB01 D14 EW10-SB02 Note that S16 is in the no action area. b) Table revised. Note that the table shows all cores >RALs/SQS without excluding >cleanup screening level (CSL). For reference, the five cores that are <CSL but >SQS are: D5 D9 D10 EW10-SC29 EW10-SC54 Text revised to include >CSL for clarity with 13 as the correct number, considering the two lists above. c) Table corrected (2 is correct). d) Table corrected (8 is correct). For reference, the total >RAL/ SQS is: S01 S15 S20 S11 S16 S47 S13 S18
325	9.8.3.1	9-98	Correct the typo: "...8 and 13 respectively; one core greater than CSL and two cores greater than RAL/SQS..."	Text revised.
326	9.9.3.1	9-109	Correct the typo: "...8 and 13 respectively; one core greater than CSL and two cores greater than RAL/SQS..."	Text revised.
327	9.9.5.2	9-112	In the first paragraph of 9.9.5.2, there is a reference to "Alternative 5" which does not exist anymore; correct.	Text revised.

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328	9.14.1	9-162	Correct the typo in the last paragraph: "Figures 9-7a and 9-7b...".	Text revised.
329	9.15.1.2	9-167	Correct the typo in the first full dash/bullet: "...results in a slightly greater change onin predicted SWAC...."	Text revised.
330	9.15.2 & Appdx J, Sect 5.1.3	9-170 & 46 in Appdx	Recovery of the LDW sediment bed (decreasing LDW SWAC with time) is not included in any of the EW sensitivity analyses. It was not included because the percent of LDW bed sediment that enters the EW is small. Somewhere in the FS, it needs to be mentioned that it is reasonable to assume that recovery of the LDW sediment bed will have little effect on EW SWAC or point concentrations. A same argument can be made for LDW lateral loads.	Added to Section 9.15.1.2 and Appendix J, Section 5.1.3.

Section 10

Comment #	Section #	Page #	Comment	Draft Response
331	Table 10-1	10-2 to 10-7	Consistent with Comment #2, remove references to compliance with MTCA/SMS once regional background is established.	Text revised per comment.
332	Table 10-1	10-2 to 10-7	The following comments regarding the star ranking system need to be addressed: a) The long-term effectiveness ratings are biased high, particularly given that, although risk is reduced, none of the alternatives actually meet EPA's risk thresholds. More emphasis needs to be given to overall risk levels achieved, not simply if risk is reduced. b) For the permanence categories given to each technology for long-term effectiveness (e.g. Table 11-1), it is confusing to use "highly permanent" as the middle category. This need to be revised to "moderately permanent". In addition, it is EPA's experience that in situ treatment is a moderately permanent technology, not a less permanent as shown in Table 11-1. The permanence calculations need to be revised to include in situ as moderately permanent. c) For short term-effectiveness, although it is important to capture environmental impacts, by including landfill capacity consumption, energy consumption, air emissions, carbon footprint, etc., the environmental impacts become disproportionally emphasized. Environmental impacts need to be condensed and simplified into a single metric that is proportional to the overall environmental impacts. EPA believes that 'total volume removed' is appropriate to use as this metric, as it captures the overall size of the alternatives, and is the common factor dictating the magnitude of the other environmental impact metrics evaluated. d) Section 10.2.3 needs to better describe what emphasis was given to diver assisted hydraulic dredging versus other categories evaluated. It appears from the star rakings that diver dredging may have been over emphasized, particularly for the alternatives that only include 2 years of diver dredging, but the description is insufficient to fully understand what influence this metric had. e) For short-term effectiveness, Section 10.2.3.4 needs to be clearer about the ranges applied to each category. For example, for removal "moderate impacts" were first described as 910,000-960,000 cy, then "lower impacts" were described as 820,000-960,000 cy, and then "least impacts" were described as 810,000 cy. These ranges overlap and are not proportional. The ranges for removal and the other metrics, need to be revised to better represent the range of alternatives and clearly define what low, medium, and high are. f) For Implementability, EPA considers diver-assisted hydraulic dredging to be moderately implementable. The description in Section 10.2.4.1 currently describes diver dredging as having "large technical challenges" and implies that it has low implementability. This description and the corresponding rating need to be revised to reflect moderate implementability for diver dredging. g) For cost, the description in Section 10.2.5 needs to clearly state how the cost ranges for each star level were determined.	Per discussion in Comment Resolution Meeting #3 on July 6, 2017, a row was added for each balancing criterion to explain the basis the star rankings. The rankings for reduction in toxicity, mobility, or volume through treatment have been modified to be 1 through 5, consistent with the other criteria. Responses to specific sub-comments: a) Row added to explain the basis of how each star ranking is set. The number of stars continue to range from 1 to 5 stars for long-term effectiveness and permanence. b) Created a new category for in situ treatment in Table 11-1 called "moderately permanent: in situ treatment" and kept the other designations the same. c) Environmental impacts are generally proportional to total volume removed, but all work activities contribute to environmental impacts. Row added to explain the basis of short-term effectiveness star rankings and the short-term metrics considered in equal proportions (i.e., short term environmental impacts are not ranked disproportionately compared to worker protection and time to achieve RAOs). d) New row added to Table 10-1 with basis for star rankings for short-term effectiveness. Diver dredging is a key factor as part of community and worker protection during construction, one of the three metrics used to evaluate short term effectiveness. Text in Section 10.2.3 clarified. e) Volume ranges described in Section 10.2.3.1 group volumes with respect to transportation related impacts, while Section 10.2.3.4 described overall construction impacts. Section 10.2.3 was revised per comments. f) As discussed during a meeting on September 1, 2017, with EPA, specific technical challenges of diver-assisted hydraulic dredging was expanded to support the star rankings. Additional text has been added to Sections 7.2.6.3, 9.1.2.4, and 10.2.4.1. g) Row added to explain the basis of how each star ranking is set for costs.
333	Table 10-1	10-2	For 'Overall Protection' rows (first four rows), it is confusing to intermix comparisons to PRGs and risks. As this section is about "magnitude and type of residual risk", it needs to primarily discuss residual risk. If a PRG needs to be discussed in addition, state the basis for the PRG (e.g. 10^{-6} cancer risk, HI of 1, background).	Added basis for comparing to the arsenic PRG for RAO 2 (based on the natural background). Benthic risks have been revised to compare to percentage of locations achieving all benthic PRGs (which are equivalent to benthic SCO in SMS) because other risk metrics are not calculated for RAO 3.
334	Table 10-1	10-2	Correct the following excess cancer risk values for 'Overall Protection' for RAO 1 (first row), to be consistent with Table 9-5b: a) For the No Action alternative: "...excess cancer risk of ~~4~~5 x 10^{-4} (Adult Tribal RME), ~~8~~9 x 10^{-5} (Child Tribal RME)..." b) For the other alternatives: "(Adult Tribal RME), ~~3 to~~ 4 to 5 x 10^{-5} (Child Tribal RME,.."	Table 10-1 revised for consistency with Tables 9-5b and 9-5d.
335	Table 10-1	10-2	Correct/clarify the following for HQ values for 'Overall Protection' for RAO 1 (first row): a) For the No Action alt.: "...and 9~~ x 10^{-4}~~ (Adult API RME)." b) For the other alternatives: Clarify that the presented HQ values are for the total PCBs immunological endpoint only (which are the highest among the three scenarios in Table 9-5c).	Table 10-1 revised for consistency with Tables 9-5b and 9-5d, and text was added for clarity, where applicable.
336	Table 10-1	10-2	For the 'Overall Protection' for RAO 3, action alternatives (third row): because Alt 1A(12) has different results from the other alternatives, use a separate column for 1A(12) (similar to the row for 'Compliance of ARARs', MTCA/SMS, RAO 3).	Separate column added for Alt.1A(12) for RAO 3.

Comment #	Section #	Page #	Comment	Draft Response
337	Table 10-1	10-3	For the 'Compliance with ARARs' MTCA/SMS rows: it seems incomplete to not include RAO 4 along with the other RAOs. Include, or add a footnote indicating why it is not included in the table.	Row added for RAO 4. Table 10-1 was also updated to be consistent with text changes in the compliance with ARARs sections of the FS document. Text in Table 10-1 also updated for accuracy for RAO 2 in the No Action Alternative .
338	Table 10-1	10-5	For the rows 'Time to Achieve RAOs' RAO1: it is unclear why there are two API scenario versus one each for the adult and child tribal scenarios. Revise for consistency, or add note indicating reason.	Footnote k of Table 10-1 added to clarify that the risk thresholds were selected to differentiate the alternatives.
339	Table 10-1	10-5	For the rows 'Time to Achieve RAOs' RAO1: clarify why the adult tribal and child tribal scenarios are evaluated against different risk thresholds (10^{-4} vs 10^{-5}).	Footnote k of Table 10-1 added to clarify that the risk thresholds were selected to differentiate the alternatives.
340	Table 10-1	10-5	Consistent with Comment #9, the time to achieve RAO 2 needs to reflect the fact that the PRGs and risk do not continue to be met following year 0 or 5.	Footnote l of Table 10-1 revised to clarify how the arsenic RAO 2 PRG is met following construction but increases in the long-term.
341	Table 10-1	10-5	For the row 'Time to Achieve RAOs', RAO2, cPAHs, clamming areas (fourth row from bottom): based on Table 9-2, the No Action alternative does not achieve the clamming PRG for cPAHs (at year 40 the SWAC is 166 and the PRG is 150); Table 10-1 currently shows 20 years to achieve for the No Action alternative. Correct this value to "Does not achieve".	Time to achieve is based on risk threshold presented in Table 9-6a. Reference added to footnote l. The risk threshold is met for cPAHs because a range of sediment concentrations rather than a single value result in meeting the risk threshold.
342	10.1.1.1	10-8	Based on Table 9-5b, revise the following in the last line of the page: "…Adult Tribal seafood consumption RME scenario, 34x10^{-5} for the Child Tribal seafood consumption…"	Revised per comment.
343	10.1.1.1	10-9	Based on Table 9-5b, revise the following in the first (partial) paragraph: "Alternative 1A(12) is predicted to achieve 3x10^{-4}, 45x10^{-5}, and 1x10^{-4}…."	Revised per comment.
344	10.1.1.1	10-9	Only RAO 1 is discussed in this section. Include narrative for the other RAOs.	Narrative added for the other RAOs.
345	10.2.1 and sub-sections	10-14 to 10-23	For evaluation of long-term effectiveness, the FS includes a qualitative analysis of vulnerable inventory left behind. However, a quantitative analysis would be much more beneficial to the reader. The authors state that the EW has potential for propwash to mix sediment to a depth as much as 5 ft. EPA considers this remaining mass a relevant factor when evaluating long-term effectiveness and permanence of various remediation alternatives. Explain if it is possible to extract such data (mass of contaminant that remains "vulnerable") from the box model output coupled with TIN-based contaminant mass removal analysis (Appendices H and F). If such a calculation can be made, it would be a helpful quantitative method to compare alternatives for long-term effectiveness. Buried contaminant inventory has the potential to effect SWAC well past the 30 year simulation period. Therefore, it is necessary to quantify the buried contaminant mass vulnerable to propwash for each remediation alternative.	As discussed in Comment Resolution Meeting #2 (June 15, 2017), text presented in Section 10.2.1.1 explains that the model considers mixing and disturbance of contaminated sediment remaining after remediation and therefore quantified the impact of subsurface contamination left behind. Core stations remaining and technology areas are also used to quantify contaminated sediment left behind. To address the comment, language has been added to Section 10.2.1.1 to quantify the volume of contaminated sediment that could be disturbed for the No Action Alternative.
346	10.2.1.2	10-20	Correct the typo: "The scope and duration of monitoring are similar for ~~that~~the action alternatives."	Text revised.
347	10.2.3.3	10-28	The second sentence for RAO 2 appears to be an incomplete sentence/phrase. Revise as necessary.	Text revised.

Section 11

Comment #	Section #	Page #	Comment	Draft Response
348	11.1	11-3	The description of the Figure 11-1 dots ("full red dot" and "full black dot") are not consistent with the current figure. Correct.	Description revised consistent with current Figure 11-1.
349	Table 11-1	11-4 to 11-5	Consistent with Comment #2, remove references to compliance with MTCA/SMS once regional background is established.	Text revised for consistency with Comment Resolution Meeting #1 on June 12, 2017. Regional background is retained as a possible way to comply with MTCA/SMS, but language is removed that the alternatives are expected to comply with regional background.
350	Table 11-1	11-5	a) For Time to Achieve RAOs, the timeframes given are not consistent with the timeframes given in Table 10-1 which shows that PRGs and some risk reduction for RAO 1 are not predicted to be achieved within the 40-year modeling range. Add this information to this section. b) In addition, consistent with Comment #9, the timeframes need to reflect that PRGs and risk for RAO 2 do not continue to be met following year 0 or 5.	a) Time to achieve RAOs in Table 11-1 have been revised to be consistent with Table 10-1 and Figure 11-2; however, Table 11-1 is meant to summarize the details contained in Table 10-1. b) Added footnote in Section 11.1.5 to address Comment 9 on achievement of RAO 2 for arsenic and cPAHs, also consistent with Sections 9 and 10.
351	11.1.1	11-6	Based on Table 9-5b, revise the following in the second paragraph: "…. ~~3 or~~ 4 or 5 x 10^{-5} ~~from the Child Tribal seafood consumption~~ RMC scenario…"	Revised consistent with Table 9-5b.
352	11.3	11-20	The uncertainty discussion needs to include language describing that in situ treatment of underpier hot spot areas poses more uncertainty versus removal. These hot spot areas pose a greater threat to potential recontamination and not achieving SWACs. However, because of their small area compared to the full waterway, this impact cannot necessarily be fully captured in the alternatives ranking analysis.	Text was added to this section per comment.
353	Figure 11-2		Incorporate same comments from ES Figure 10 (Comments #89-91)	Figure 11-2 (time to achieve RAOs) has been revised per Comments 89 through 91.

Appendix A

Comment #	Section #	Page #	Comment	Draft Response
354	Appdx A, Part 1	All	When discussing PCBs be clear that it is total PCBs.	"Total" added where appropriate.
355	Appdx A, Part 1	All	Include EPA's natural background values (95UCL from the Bold data set) along with the Ecology/SCUM II values.	As discussed in Comment Resolution Meeting #1 on June 12, 2017, text was modified to reference the CERCLA PRGs (Appendix A, Section 2).
356	Appdx A, Part 1; Sect 1	2	Consistent with Comment #2, remove reference that "…alternative will likely comply with SMS requirements…once regional background levels are established…"	Text revised per Comment 2.
357	Appdx A, Part 1; Sect 2	4	Consistent with Comment #190, revise the PCB background value to be consistent with the current (2015) version of SCUM II.	Value is consistent with the April 2017 SCUM II review draft.
358	Appdx A, Part 1; Sect 3	5	The second paragraph states "RBTCs associated with CSL (excess cancer risk of 10^{-5}…) are presented in FS Table 4-4…" Table 4-4 does not strictly show the 10^{-5} cancer risk value. Revise this statement to reflect what is actually shown in Table 4-4.	Reference changed to Table 3-13.
359	Appdx A, Part 1; Sect 3	5	See Comment #2 regarding regional background. Revise the statement in the second paragraph "Because regional background includes impacts from stormwater and other diffuse sources, regional background will be higher than the SCOs for PCBs and dioxins/furans."	Sentence deleted and text revised per comment.
360	Appdx A, Part 1; Sect 3	6	Consistent with Comment #2, remove reference that the CSL will be based on regional background concentrations.	Text revised per the comment.
361	Appdx A, Part 1; Sect 3	6	It is stated at the end of the first (partial) paragraph: "However, in the absence of regional background concentrations, the CSL has not been established for total PCBs or dioxin/furan." Regional background is not the only method by which an upper tier CSL is developed based on MTCA. A risk-based concentration and the PQL needs to also be taken into consideration. Explain why these were not included.	Explanation added.
362	Appdx A, Part 1; Sect 4	7	A technicality, but the rules for upward adjustment of the SCL described in Section 4 only apply to upward adjustments that remain below the CSL (Section iii of the WAC code). It's really at this point that the PRG deviates from SMS. Add this to the discussion.	Sentence added to Section 4.3 of this appendix that SCL adjustment may not go above RB.
363	Appdx A, Part 1; Sect 4.1.2	13-14	When discussing data from Elliot Bay, briefly describe the difference between "inner" and "outer" Elliott Bay (i.e. where is the division line?).	Description added in new footnote.
364	Appdx A, Part 1; Sect 4.3	16	Paragraph 2: This statement indicates that "when considering all these areas together" achievable PCBs cleanup levels (site-wide SWAC) is 57 ug/kg dw when considering areas near structures. This value is much lower than that reported as "achievable concentrations for all lines of evidence" of 153 ug/kg dw (Page 16 Paragraph 3). Clarify the apparent discrepancy.	No changes made. The text indicates a range from 9 to 153 µg/kg dw in the long term, which bounds the year 0 post-construction value of 57 µg/kg.
365	Appdx A, Part 1; Sect 6	19	Consistent with Comments #1 and #2, remove reference that SMS will be achieved with establishment of regional background or an SRZ.	Section 6 of Appendix A was revised for consistency with Comments 1 and 2 and the discussion in Comment Resolution Meeting #1 on June 12, 2017.

Appendix B

Comment #	Section #	Page #	Comment	Draft Response
366	Appdx B, Part 1; Sect 2	3	Waves due to ship wake may reflect off riprap or otherwise be trapped under piers to significantly magnify the potential erosional sources ("currents due to ships"). This scenario was apparently not addressed due to PTM model limitations. Describe the potential impact this transport pathway could have?	Text was added.
367	Appdx B, Part 1; Sect 3.3	9	Change to "lateral".	Revised Section 3.3 title per comment.
368	Appdx B, Part 1; Sect 3.3	9	Although seemingly obvious to most, the term "lateral" needs to be defined (i.e., "points of potential release entering the EW along the length of the channel").	Text was added to the first sentence of Section 1 to address this comment.
369	Appdx B, Part 3A; Sect 2.1.3	6	Expand (with references to sources) upon impacts to post-construction SWAC values for having 50% loss. Explain if SWACs of the final residuals are limited to one-half of the redredged material concentration. This is a significant limitation of a one-pass removal, and raises whether second-pass or no-pass/capping is the appropriate approach to address the problem.	Additional text and citations to literature added. Reference also added to Appendix B, Part 5, which evaluates residuals management options. Also, the commenter should note that the equations do not mean that the concentrations reduce by one-half. The final concentration in the BAZ is dependent on the final thickness and concentration of both the residuals layer and the underlying sediment (provided the residuals layer is thinner than the BAZ thickness). This equation is consistent with field observations of concentrations following re-dredging. Note that this equation does not represent a limitation of one-pass removal because the percent loss for native material is 5%. Text also added to Appendix B, Part 5, Section 2.2.3 for consistency.
370	Appdx B, Part 3A; Sect 3	12	Explain how the 2.3 ft thickness estimate for under pier areas was derived. Were depth to riprap surveys conducted? How does depth uncertainty impact this estimate?	Reference added to Section 8.1.1.6 and Appendix F regarding jet probe data. Data were collected to measure lateral extent of sediment in underpier areas and sediment thickness along transects. The estimate represents the best estimate with uncertainty on either side (i.e., represents the best estimate within a range of potential actual values).
371	Appdx B, Part 3B; Sect 3.1	5	The end of footnote 3 indicates that finer particles tend not to settle in the EW and LDW. However, in other places it indicates that little coarse grain particles enter EW and the most if it is fine-grained. These two ideas aren't consistent considering net sedimentation is occurring. Revise the various discussions as appropriate to make the overall sedimentation concept consistent.	The text was modified to indicate that only the very fine particles exit the EW. Based on modeling work, fines enter the EW then some leave and some settle. This partial sedimentation of the incoming load results in net sedimentation in the EW.
372	Appdx B, Part 4; Sect 5	14	Correct the typo in the second sentence: "Current conditions for modeling purposes was defined as now through…."	Revised per comment.
373	Appdx B, Part 5; Sect 2.1	3	Issue of "missed inventory" needs to be highlighted as a key factor to achieving the SWAC goal.	Text was added to address this comment.
374	Appdx B, Part 5; Sect 3.1.2	14	In the second paragraph, the statement "Silt curtains could actually increase the quantity generated by concentrating suspended solids," is confusing. Silt curtains don't affect how much is generated from dredging, only where it settles out. It would be more accurate to say that it affects the area over which settling occurs, thereby potentially affecting the depth of the settled residuals layer.	The text was modified to make clarification.
375	Appdx B, Part 5; Sect 3.2.2	19	The end of the first paragraph indicates RMC may be placed either at the end of each year or the end of all dredging. The calculations, which are consistent with previous discussions, only represent RMC placement after all dredging is complete. Revise this sentence in Sect 3.2.2 to be consistent.	Text was added to clarify that RMC placement is assumed to occur at the end of all dredging; however, this assumption could be refined during remedial design.
376	Appdx B, Part 5	Table 4-1, pg 20	There are three blank rows in the fourth section. Remove rows or explain why they are blank.	These are heading cells. Cell merged and text below indented for clarity. Note that Table 3-2 has been added to Appendix B, Part 5, to address "Backcheck" Comments 23, 27, 256, and 282.
377	Appdx B, Part 5; Sect 5	26	Revise reference to Section 2.3, Paragraph 1 for description of "interior unremediated islands".	Revised per comment.

Appendix C

Comment #	Section #	Page #	Comment	Draft Response
378	Appendix C	General	It's stated that OC normalized concentrations can't be interpolated using IDW. Explain why this is. The assumption is that TOC and PCBs may not have been collected at the same locations, meaning some samples wouldn't be included in the IDW interpolation. If this is the case, the same issue would be present for the Thiessen method used in Section 6 of the FS. It is unclear why not being able to interpolate OC normalized concentrations was a deal-breaker for IDW, but not the Thiessen polygons. Provide an explanation as to why this is the case.	No change was made. Section 2.2 of this appendix text already responds to the comment (second paragraph): *"IDW is better suited to interpolate dw sediment concentrations rather than OC-normalized concentrations. In order to develop an IDW interpolation of OC-normalized concentrations, IDW would have to be conducted independently for both PCB dw concentrations and total organic carbon (TOC) concentrations, and then those grid layers would have to be combined to generate an IDW for OC-normalized concentrations. This approach compounds the uncertainties in the IDW interpolation because two different parameters would be interpolated and then combined. Therefore, the level of uncertainty with IDW for OC-normalized concentrations is likely greater than uncertainties associated with OC-normalized interpolation based on Thiessen polygons."*
379	Appdx C; Sect 3.1	7	Describe the sampling design that would be employed/suggested to support the remedial design. Also, little description of the subsurface contaminant distribution (by either Thiessen polygon or IDW methods) is provided. Explain what the neat line looks like in light of these present results.	No change was made to Appendix C, which only addresses the remediation area. The first half of the comment is addressed already in Section 8.1.3 and Appendix G (for discussions of design and baseline sampling). The second half of the comment is addressed in Appendix F (for the neatline development) and Appendix H (for a depiction of subsurface conditions). Interpolation using Thiessen polygons or inverse distance weighting (IDW) of subsurface contaminant distribution would not add value beyond the data provided in these appendices.
380	Appdx C; Sect 3.2	8	It is stated that "…1) this matrix interference only occurs in a few samples," but this is the only time that a 'matrix interference' is described in the whole Appendix. Add a discussion of what this interference is, or remove this sentence.	Text was added that the matrix interference is what causes the laboratory to report a higher reporting limit.

Appendix D

Comment #	Section #	Page #	Comment	Draft Response
381	Appdx D; Sect 2	2	Specify what the model is (CapSim, steady state), and the current version (e.g. CapSim v1.12, 2012). Is the BAZ layer mixing included in the model? If not, what mixing rate is assumed?	Text was added. It is the steady state cap model, version 1.19, June 8, 2012. BAZ layer mixing is in the model; text revised. The rate of biodiffusion in the BAZ is listed in Table 1.
382	Appdx D, Section 3	4	Justify use of average concentrations and verify that the contamination layer in contact with the cap is typically used as the best source estimate of potential contaminant migration.	No changes were made. As discussed in Section 3, as a conservative approach, the maximum concentration underlying the cap was used as the input value for the model for this FS-level evaluation. Additional cap modeling will be conducted as part of design. Text was added to Section 3 to indicate that the underlying sediment is the source concentrations.
383	Appdx D	Table 1	It is unclear how the 'contaminant concentration in sediment' (8th row) was determined. The values chosen are indicated as maximums, but do not appear to be the maximum values presented in FS Table 2-1 or the SRI. Correct, or explain why these values are different from the Table 2-1/SRI data.	Text in Table 1 and Section 3 revised to clarify that the maximum concentration is the maximum from samples for proposed capping areas for any FS alternative.
384	Appdx D; Table 2a		This Darcy velocity is not particularly high, being 20X + lower than that used for the intertidal condition. Explain if uniform groundwater flow conditions exist across the site. Also explain the uncertainty of using the literature values (Fabritz, 1998) versus site-specific data for estimating Darcy velocity.	Text was added to Table 1 to indicate there are no site-specific data in subtidal EW areas, but it is generally accepted that flow velocities are higher in intertidal areas. Also, lower velocities have been demonstrated in subtidal areas in the Duwamish basin. Additional data may be needed during design.
385	Appdx D; Table 3		The selected PAHs exclude lower Koc compounds (i.e., naphthalene with log Koc of 3.3), which will greatly increase the prediction of vertical migration and potential break through. This would also apply to specific carcinogenic PCB congeners as well. Discuss this uncertainty of using high Koc compounds as it relates to potential breakthrough and surface concentrations above the cap.	No change was made. Comment already addressed in Section 5.2: "Compounds with lower Koc values than those used in this analysis will migrate more quickly than PCBs; other compounds will be evaluated as necessary in remedial design during location-specific capping evaluations." Note that the sensitivity analysis captures the low end of Koc for PCBs. Note that cPAH compounds are referenced because they represent a human health risk driver at the site (cPAHs do not include naphthalene).
386	Appdx D, Attach. 1; Figure 1-1		This figure is lacking a legend to explain the boundaries being displayed. Revise.	Legend added.

Appendix E

Comment #	Section #	Page #	Comment	Draft Response
387	Appdx E; Sect 2.2	5	Diver-assisted dredging costs are a key factor in the comparison of remedy options. Provide some detail on costs of other projects. If this is done infrequently, lack of experience needs to be factored into the cost uncertainty.	Text was added per comment. Additional detail added on project costs
388	Appdx E; Sect 2-4	7	Contingency remediation is stated as 10% of MNR, ENR, and in situ areas. Chapter 8 and Appendix E Table 1 uses 15%. This needs to be corrected.	The text was corrected to state 15%.
389	Appdx E; Sect 4	11	Explain if costs associated with "weather days" or down time for equipment maintenance and repair are captured.	Text was added to Section 3 of this appendix per comment.
390	Appdx E; Sect 4	11	State if the costs of sampling in support of the remedial design are included in the overall estimate.	Section 2.4 of this appendix has been updated to note remedial "sampling" as a pre-construction expense. Also "sampling" has been added to line item 8a in Table 1.
391	Appdx E; Sect 4	11	Elaborate how fisheries migration can impact costs beyond the fish windows remobilizations already assumed. Explain if this is possibly related to marine mammal restrictions.	Salmon runs added to the bullet that references working around fishing vessels. Marine mammal restrictions are not expected for dredging work and are therefore not mentioned in the text but will be revisited during permitting.
392	Appdx E	Table 1	The Unit Cost Notes for Item 1a indicate "…approximately 20 days mobilization and 15 days mobilization…" It would seem one of these needs to be demobilization; correct as needed.	Text revised.
393	Appdx E	Table 1	Make sure the "TM" is superscripted on all of the "AquaGate+PAC™".	Text revised.
394	Appdx E	Table 1	For item 3e (Transload, Transportation and Disposal), based on the description it appears that transportation from the rail facility to the landfill is not included. Include, or explain why it is not needed.	The likely landfills accept rail directly. Table updated.
395	Appdx E	Table 5	The shaded rows (subtotals & totals) are missing values. Add these values.	"n/a" added to the quantity subtotals—subtotals only apply to costs.

Appendix F

Comment #	Section #	Page #	Comment	Draft Response
396	Appdx F; Sect 2.4	7	Explain what volume contingency is reserved for volumes associated with constructible dredge prisms.	Title of Section 2.4 changed to "Constructable Dredge Volume Calculation" for clarity. The 1.5 factor is the "constructability" factor that includes all factors bulleted in Section 2.4 of this appendix. Additional paragraph added at end of Section 2.4.
397	Appdx F; Sect 2.4	7	Explain how often the maximum depth of RAL exceedance was not captured. Explain what effect this has on the volume uncertainty.	No change was made. Comment is addressed in Section 4 of this appendix----43% of cores used in the volume analysis had exceedances at the last interval of the core. As presented in the text, to gauge the effect of these cores on volume uncertainty, if an additional 1 foot is dredged in these locations, then the total dredge volume would increase by 12%.
398	Appdx F; Sect 2.4	7	Explain how slumping sediment adds to the removal volume.	No change was made. Slumping is included as a bullet in Section 2.4 and is part of the 1.5 factor.
399	Appdx F; Sect 2.4	7	This constructability factor is presented as a multiplier of sediment volume for remedial volume estimation (and cost estimation). This is a major source of uncertainty and requires a more detailed analysis for the EW than simply referencing past project experience for validation.	Text was added in Section 2.4 to provide a general justification of the constructability factor in terms of overdredge, side slopes, and contingency. The 1.5 factor times the neatline volume is a commonly accepted method to generate FS-level volume estimates.
400	Appdx F; Sect 4	10	Explain where the additional 1 ft of contamination assumption is presented, and how is it justified. If current composite core lengths are 4 ft or greater and contaminated layers could extend 3 ft or more (but masked by blending). State this here.	The 1-foot assumption was based on looking at nearby cores. Reference made to Section 2.1 and clarifying text was added to Section 2.1. Bullet added about the effect of thicker samples.
401	Appdx F; Table 2		Explain if an overdredge allowance has been included in the calculation.	No change was made. Comment is already addressed in Table 2; footnote a, states that overdredge is included in the 1.5 constructability factor.
402	Appdx F	Figures 2a, 2b, 3a, 3b	Correct the matchline figure reference (currently references Figures 1a and 1b)	Figures revised.
403	Appdx F	Figures 4a, 4b	Correct the matchline figure reference (currently references Figures 2a and 2b)	Figures revised.

Appendix G

Comment #	Section #	Page #	Comment	Draft Response
404	Appdx G	2	Both O&M monitoring and long-term monitoring are described as "measure post construction and long-term performance," and both occur during the 20 years post-construction. Clarify how these types of monitoring are different.	Clarification added.
405	Appdx G	3	For Section 3, state that the cost is assumed to be similar to O&M years 5, 10, 15, and 20. (This was stated in Table 1, and similar statements were made for other sections; it needs to be consistent here too).	Clarification added to the first paragraph of the section.
406	Appdx G	4	First bullet: clarify what kind of daily surveys are being referenced. Bathymetric?	Bathymetric—text clarified.
407	Appdx G	4	Fourth bullet: clarify what "payment surveys" are; this is not a common term.	Bathymetric—text clarified.
408	Appdx G	5	Table 1 shows that Year 3 sampling is significantly different than the other years. Briefly explain in Section 5 why this is.	Text was added.
409	Appdx G	5	The last sentence references physical inspections. Is this referring to inspections by a diver? If so, this needs to be clarified as diver operations are a significant cost.	Reference to diving added.
410	Appdx G; Sect 6	6	The original baseline data set was based on 4-ft core composites. Within that layer, individual horizons exceeding the RAL could exist, especially in the BAZ, which could greatly underestimate risks. Explain how this potential exposure would be monitored after the remedy is complete. Also see comment above on Appendix F, Section 4, page 10 (Comment #400).	No change was made. The RI dataset included surface sediment grabs and most cores with intervals of 1 to 2 feet and a much smaller number of cores with 4-foot sample intervals (e.g., the SRI dataset). Risks in the BAZ following construction will be measured by directly sampling the BAZ (surface sediment sampling).
411	Appdx G	Table 1	Surface water sampling is presented in the table, but not discussed in the narrative sections. Add a narrative where appropriate.	Text was added to Sections 3 and 6.
412	Appdx G	Table 1	Footnotes: Explain why some PCB analyses are listed as Aroclors and others as congeners. Clarify why different methods are assumed (or remove if assumption isn't necessary for the conceptual detail in this appendix).	No change was made. As noted in this appendix, the conceptual monitoring framework serves solely as the basis for estimating the costs, and details will be developed during design. The sampling assumptions provide a representative framework for detailed testing.
413	Appdx G	Table 1	If PCB methods are retained (see previous comment), clarify in footnote (b) which is assumed.	Clarified footnote b for PCB congeners.

Appendix H

Comment #	Section #	Page #	Comment	Draft Response
414	Appdx H	General	This section presents the core results for subsurface sediments but does not discuss the distribution or otherwise present Thiessen polygon or IDW results to understand the potential distribution. Add a results section and elaborate further on the overall patterns.	This appendix is intended as a reference to the reader. However, some discussion has been added to the text (new Section 3).
415	Appdx H	Figures 5a & 5c	The coloring for core EW10-SC31 is not consistent with the analogous maps for the other alternatives. It appears the bottom half (below the hatching) needs to be green, not yellow. Verify and correct.	No change was made. For the sample in question, the concentration is 10.5 mg/kg OC for total PCBs, which exceeds the RALs for the (7.5) alternatives (yellow) but not the (12) alternatives (green).
416	Appdx H; Sect 2	5	Consistent with Comment #224, the description of the seven excluded cores needs to be expanded upon to explain why they are not appropriately representative. The revised description in Section 6.1.2.1 can be referenced, if appropriate. Also, it is indicated that seven cores were excluded, but eight cores are listed; revise.	A discussion section was added to the text describing in more detail the reason for exclusion of the eight cores. The number of cores was also corrected to eight.

Appendix I

Comment #	Section #	Page #	Comment	Draft Response
417	Appdx I, Part 1; Sect 4	13	The discussion of efficiency of train, truck and barge is confusing. First, "gallons" is not an efficiency - a more appropriate efficiency calculation would be gallons/mile/ton. Also, the total gallon calculation represents transport of different material. These values should not be compared. It is expected that transporting something only 20 miles would require less fuel than transporting something 284 miles, no matter what the transportation method is. Provide clarification of what this efficiency calculation is meant to represent, and how it helps with decision making.	Text revised for clarity. The observation is made that rail is most efficient but still has the largest net impact on the alternatives.
418	Appdx I, Part 1	References & Tables	Nearly all of the websites given in the references are out-of-date. Update as necessary.	Outdated websites have been updated with current references. Calculations have not been updated since 2013, so references to 2013 remain that refer to factors and assumptions of calculations.
419	Appdx I, Part 1	Table 1	The note (4th column) for Tug Boat (first row) is confusing. It indicates that it will take 4 hours for mob and 4 hours for demob, but then says 8 hrs/day for 35 days each season - these are significantly different. Appendix E indicates 20 days mob and 15 days demob which is consistent with the 35 days/season. Delete or clarify what the 4 hours vs. the 8 hours are meant to represent.	Text has been revised for clarity.
420	Appdx I, Part 1	Table 1	The notes are generally confusing when it is stated "assume one X hr shift". It sounds like only one shift of only X hours is required to complete the entire task. Clarify that this is per day/week/etc.	Revised "Assume one X hr shift" to "Assume each work day contains one X hr shift" for clarity.
421	Appdx I, Part 1	Table 4	Correct the typo in the sixth row: "CO2 emission factor for ~~boats~~ truck"	Revised per comment.
422	Appdx I, Part 1	General	Change units of "kWh/hour" to simply "kW".	Revised.
423	Appdx I, Part 1	Table 9	Suggest removing the Notes column; it is already presented in Table 1 and doesn't impact the interpretation of the results being presented in this table. If retained, incorporate the same comments from Table 1.	Notes column retained for simplicity. Same comments from Table 1 have been addressed.
424	Appdx I, Part 1	Table 9	The in-table footnote references need to be updated. For example, the reference for "Tug Boat (800 HP)" needs to be 4 not 2.	The notes at the bottom of Table 9 are general—revised for clarity. There are no in-table footnote references; "tug Boat (800 HP) 2" refers to a specific tug boat—see Table 2 (Equipment Types).
425	Appdx I, Part 1	Tables 9 & 10	In the footnotes, the conversion of metric tons to grams is given as "10E-6" but it must be "1E-6". Edit, and ensure the calculations used the correct conversion factor.	Revised per comment—also confirmed that the correct value was used in the calculations.
426	Appdx I, Part 1	Table 11b	In the chart below the table, the colors are difficult to differentiate. Use more distinct colors/patterns.	Revised per comment.
427	Appdx I, Part 1	Table 12	Scale the size of the pie charts relative to the total CO2 emissions.	Revised per comment.
428	Appdx I, Part 1	Table 13	Revise the typo in footnotes c, d, and e: "Emission rates utilized is…"	Revised per comment. "Rates" was made singular.
429	Appdx I, Part 2; Sect 2.1	3	While air pollution is generically addressed and there is a lack of typical problematic contaminants (i.e., NAPL) presence of hydrogen sulfide has been observed such that there may be a need for an application of odor control technology (e.g., foam cover application) that may/may not be required during the dredging process or rail/truck transport. Address and revise this section as appropriate.	No change was made. The best management practices (BMPs) for odor will be determined during design. The EW has recently been dredged on multiple occasions and odor has not been an issue.
430	Appdx I, Part 2; Sect 3.1	7	The conclusion "Therefore, rail and barge transport are the most efficient way to reduce transportation impacts" does not follow the previous discussion. The discussion simply says that transport by truck is a large part of transportation. Sometimes the best way to efficiently reduce impacts is to slim down the biggest one. This statement needs more explanation or needs to be removed.	Revised per comment. Sentence removed.

Appendix J

Comment #	Section #	Page #	Comment	Draft Response
431	Appdx J; Sect 2.2.1	13	The referenced Figure 2 provides an ideal mix of cleanup approaches to address various areas exceeding the RAL, but the approach is likely too complex to be constructible. Explain if further analysis of these maps has been performed to produce constructible areas (and associated sediment volume estimates, costs, etc.).	No change was made. Appendix J is for modeling only; comment is addressed in Appendix F, which addresses volume increases associated with constructability. Note that contractors frequently dredge complex areas and surfaces like that shown in Figure 2 and that the figure is zoomed out, making the dredging areas look more complex than they are. In addition, the remediation areas will be refined during design. Finally, Appendix F explains how constructability was factored into the dredge volume estimate.
432	Appdx J; Sect 2.2.2	13	The equation needs to indicate "Average Incoming Solids Concentration".	The text was modified per this comment.
433	Appdx J; Sect 2.3	21	In the second paragraph the reference to Section 2.4.1, needs to be Section 2.3.1.	The text was modified per this comment.
434	Appdx J; Sect 2.3.2.1	23	Underpier areas are cited as having higher concentration sediments, and lateral exchange of particulates may be a significant source of COPCs to the main channel areas. Add information that exists as to source characterization, i.e., fingerprinting, in order to assess whether this proposed transport pathway is complete.	No change was made. Higher concentration underpier sediments redistribute into the open-water sediments following remediation. Fingerprinting has not been performed, but spatial distribution of contaminants indicates similar underpier concentrations as nearby berth area sediments. Moreover, variation in potential exchange percentage is explored through the sensitivity analysis to address the impact of this parameter. The pathway is assumed to be complete based on the CSM.
435	Appdx J; Sect 2.3.2.2	24	Reduction in bioavailability due to in situ treatment is cited as the most sensitive site performance parameter; 70% reduction is selected as the quantitative response to be achieved. A lack of site-specific direct measurement via treatability studies is a significant data gap. Add references to back up this estimate.	Reference to Section 7.2.7.1 added.
436	Appdx J; Sect 2.3.2.3	25	As noted in Comment #434, chemical source characterization to identify Green River sources versus local sources on total chemical concentrations to be achieved post-construction needs to be conducted.	No change was made. Source characterization and modeling of current and future lateral inputs and Green River inputs (which were assumed to be the same for current and future conditions), each with their respective solids loads and chemistry profiles, were used to estimate post-construction concentrations.
437	Appdx J; Sect 3.1	31	This section notes that amounts of sediment from different sources vary by point location. Describe what information exists regarding source chemistry (i.e., chemical composition also varies by point location). Quantify this assumption for use in source control/recontamination.	No change was made. Source characterization data are described in the SRI (Appendix F and Section 9.4) and summarized in Section 2.12 of the FS. Information on potential recontamination is presented in Section 5.4 of the FS using these data. All available information was used to model lateral inputs and Green River inputs to estimate post-construction concentrations.
438	Appdx J; Sect 3.1	31	This section discusses underpier mixing and draws the assumption of fully mixed sediments. Radiological dating of core profiles was performed at many locations and the presence of the Cs-137 peak indicates a lack of vertical mixing. Explain if this information can be used to derive more technically supportable estimates of vertical mixing extent.	No change was made in this section, which just describes inputs to the point mixing model. Geochronology cores were used to estimate the extent of vertical mixing for the waterway, as described in FS Section 5.3.3, but none of these cores were collected in underpier areas. No Cs-137 peak was present in any geochronology cores adjacent to T-18 berths 1 through 4, T-25, or T-30, suggesting berthing operations mix this sediment and the adjacent underpier areas.
439	Appdx J; Sect 3.1	31	Correct the typo: "...we derived from sampling conducted between 2001 and 2009, as shown in Figure 56."	The text was modified per this comment.
440	Appdx J; Sect 5.1.4	47	This section states that catch basin sediments may not be representative of what is discharged through the outfall. Explain if this uncertainty has been evaluated, i.e., whether distinct chemistry sources exist due to local chemical releases reflective of site-specific releases.	No change was made. This section is intended to describe the uncertainties associated with assigning lateral solids inputs. The City, County, and Port considered all available data, including inline sediment traps, whole water samples, catch basin samples, and other information to best estimate ongoing and future lateral input concentrations. Although the uncertainty of whether catch basin samples are representative of what is being discharge has not specifically been evaluated, all data collected by the parties were also used to evaluate whether distinct chemistry sources exist that require further investigation and response actions.
441	Appdx J; Sect 5.1.6	50	This section notes that actual undredged sediments that are part of the new surface chemistry may exceed the cleanup goal. Unlike the dredge residuals, the thickness of this layer is unknown and may be a far more significant recontamination source if disturbed than the dredge residuals. Explain if any analysis of spatial variability has been conducted to assess whether this is likely to occur. Lines of evidence would include isolated cores having a deep layer of contamination, and whether distributions (chemical contours) are uniform or sporadic. See comment on Appendix H, Remaining Subsurface Contamination, Section 3, Results.	No change was made. The unremediated areas are, by definition, below RALs in the upper 2 feet. RMC would be employed if generated residuals result in an impact to surface sediments. The potential for these areas to scour is built into the model (i.e., the model assumes that these areas experience some mixing); therefore, long-term SWACs assume some of this material is mixed. An inventory of remaining contamination is included in Appendix H, but that material is not expected to be exposed as a result of propwash scour based on modeling.

Appendix L

Comment #	Section #	Page #	Comment	Draft Response
442	Appdx L; Sect 3.1.2	9	The text states that dredging is the primary remedial technology because of navigational depth requirements. This is not entirely accurate. The purpose of the remedial action is to reduce risks, not to achieve navigational depth goals which are important but not principal to meet PRGs. Deeper dredging would reduce propwash forces that may resuspend COCs, hence is a remedial technology for that reason. Clarify the technology selection goals.	Text clarified. We agree that the purpose of remediation is to reduce site risk toward meeting PRGs. In areas where risk needs to be addressed, dredging is selected over other technologies for consistency with site use (i.e., maintain navigation depths). Dredging is not selected to reduce propwash forces.
443	Appdx L; Sect 3.2	12	Explain if an analysis has been performed on disposal costs based on reuse of sediment as daily cover versus solid waste.	No change was made. Costs are the same regardless of whether the landfill uses sediment as daily cover or solid waste.
444	Appdx L; Sect 3.2	12	Explain if there are presently disposal sites available with the required capacity and permit to accept such a high volume of material.	Additional text was added for clarity.
445	Appdx L; Sect 3.2	13	Explain if sediment removal from riprap surfaces is part of or excluded from the underpier remedial action for technology using diver-assisted hydraulic dredging. Figures 2-1 through 2-16 (in this appendix) indicate riprap is a no action area.	No clarification added because details on the active footprint are described in Section 6 of the main body of the FS, which is already referenced in Appendix L. Riprap areas with no overlying sediment were excluded (i.e., "no action" areas). Riprap areas with overlying sediment that are above one or more RALs are "action" areas (e.g., hydraulic dredging, MNR, in situ treatment, etc.).
446	Appdx L; Sect 3.2	13	In the second paragraph the time frames given of "10 years or less" and "9 to 12 years" are the exact same given the actual range of construction years (except for the no action alternative). Revise to make time frames consistent.	Text revised for consistency.
447	Appdx L; Sect 3.2	13	The ratings given (good/fair/poor) for the Implementability Screening Metric are described as a function of overall construction time and duration of underpier dredging. However, the final ratings can be directly correlated to underpier dredging only: no underpier = good; 2 years underpier = fair; 11-12 years underpier = poor. It seems that overall construction timeframe metric was either not used, or it was heavily outweighed by underpier dredging. Clarify this in the text.	Sentence added for clarification.

Remaining Draft "Backcheck" Comment Responses

Comment #	Page #	Section #	Original Comment	EWG's Comment Response	Response Backcheck	Draft Response
17	--	General	Given the Port is currently in the process of completing a waterway deepening feasibility study, the FS needs to include one deepening compatible alternative and discussion for each of the other alternatives regarding how deepening following remedial action would affect the remedy.	The deepening study was discussed in Comment Resolution Meeting #5. The deepening study is discussed in Section 2.9.2 of the FS. All of the action alternatives are compatible with waterway deepening and focus on removal in potential deepening areas.	The discussion in Section 2.9.2 is not sufficient. The Seattle Harbor deepening project is considered a reasonable future use for the EW. The FS states "EW remedial alternatives… would be compatible with the navigation improvement…" This must be expanded upon to describe how they are compatible (e.g. caps would be below dredge depth). Also include a description of how the future use by larger ships (i.e. larger propwash) will affect the alternatives and/or contamination left behind.	See response to General Comment 10 on the Draft Final FS. The SHNIP is a potential future use, but it is not a funded project; therefore, its implementation is uncertain. However, all EW remedial alternatives are also compatible with the future implementation of the potential navigation improvement project, and most importantly, the protectiveness of the selected remedy will not be reduced by potential navigation modifications.
23	ES-14 14	ES-1.7	Material used for ENR must consider the inclusion of TOC to reduce bioavailability as opposed to just its action as dilution with sand. Considering recovery by impacting the SWAC is inappropriate if the nature of the material (grain size distribution and TOC) is altered.	As discussed with EPA, ENR and in situ treatment are retained as separate technologies for evaluation in the FS. No changes made. Per discussion with EPA, the biologically active zone (BAZ) in ENR areas is expected to rebound to ambient TOC conditions; therefore, ENR with OC or AC addition is not assumed for this FS. TOC in the BAZ in ENR areas was discussed in Comment Resolution Meeting #3, WPAM #2 (Table of vertical mixing TOC concentrations), and WPAM #6 (Table 12 with TOC over time after sand placement in nearby areas).	EPA does not concur that TOC conditions will rebound as quickly as indicated. Provide specific evidence for this claim. It may be the case that the BAZ in quiescent areas will rebound after a year or two, but EW is expected to have significant mixing to depths greater than the BAZ. Given this, EPA believes that equilibration to ambient TOC conditions would take significantly longer. Further justification needs to be provided as to how quickly ENR/RMC areas are expected to equilibrate and why addition of TOC is not justified. EPA understands there have been concerns by EWG about any carbon added not staying in place. Current modeling indicates fine grained material (incoming sediment and resuspended material) does settle in EW. If the TOC added is fine-grained, it too will settle. That being said, there are non-fine grained options for TOC addition that would be even more stable. Mention this in this section.	WPAM #6 Table 12 (February 9, 2016) has been incorporated in the Appendix B, Part 5 (new Table 3-2), to support these conclusions. Reference to the appendix has been added to Sections 7.2.4 and 7.2.6.5.
26	ES-26 24	ES-1.10	2nd paragraph. Evaluation of residual risk needs to be based on the remaining degree and volume of sediments exceeding	The text has been revised for consistency with Section 10 as presented to EPA in Table 10-1. The residual risk is determined	The text remains the same as the original and was not revised. Revise text per EPAs original comment.	See response to Comment 345.

Comment #	Page #	Section #	Original Comment	EWG's Comment Response	Response Backcheck	Draft Response
			cleanup goals within the river for each Alternative.	based on the long-term risk (which is in surface and shallow subsurface sediment), and the technology areas, which indicate the area with remaining subsurface contamination. Technology areas are presented instead of volume because area is more directly related to risk.		
27	ES-27 25	ES-1.10	Capping materials, EMNR materials and RMC materials can all contain TOC (and must contain TOC), which would also provide similar reductions in toxicity and mobility as treatment alternatives as evident in comparable risk reductions. The FS (and consequently this section) must acknowledge this.	No changes made. As discussed with EPA, capping materials are assumed to have controlled levels of TOC as necessary for isolation. ENR and RMC materials do not have OC because they are expected to re-equilibrate to native TOC concentrations in a short timeframe (see response to comment #23).	Same response to Comment #23. Mention that tere are non-fine grained options for TOC addition that would be even more stable.	See response to "Backcheck" Comment 23.
38	4 1-4	1.3	3rd bullet: … above PRGs and/or remedial action levels…	Addition not made for clarity. As discussed in Comment Resolution Meetings, the RAL is developed to meet the RAOs and associated PRGs and sometimes equals the PRG and sometimes does not. Areas and volumes were developed based on the RALs only (which may or may not also equal the PRGs).	Meeting the PRGs, not the RALs, will ultimately achieve the RAOs. As described in Section 6, RALs define where remediation will occur, not what the ultimate goal is. Revise per the original comment.	Text revised to reference sections of the document for clarity. PRGs are developed in Section 4 (third bullet) and RALs in Section 6 (fourth bullet). Text also added to footnote regarding RALs identifying where remediation will occur.
55	~~10~~ 1-10	1.4.3	Revise the definition of MNR to be consistent with the definition provided in the LDW FS.	The definition was revised to be consistent with the LDW, with the distinction that limited MNR occurs above the RALs as defined in the EW (definition used this way for clarity).	The definition must be revised to indicate achievement of cleanup levels/PRGs, not RALs. Also see response to Comment #57.	Text revised to clarify the definition of MNR and natural recovery. Deleted "RALs" from the MNR definition and replaced with "cleanup objective" and "project goals." Although the goal of site-wide remediation is to meet the PRGs/cleanup levels, the location-specific point-based goals of MNR are not the same as the site-wide PRGs/cleanup levels because they are applied on a point-basis.
57	~~10~~ 1-10	1.4.3	MNR: Revise text to reflect that the intent of performing monitoring during the MNR period is to assess whether progress is being made toward achieving PRGs or CULs not RALs or in EWs case, action levels.	"MNR" is defined as natural recovery to achieve RALs with contingency actions, and "natural recovery" is defined as further natural recovery (e.g., below the RAL but above the PRG). Other language was changed to be consistent with the LDW FS definition.	The goal trying to be reached by MNR (or any remedial action) is the PRG or cleanup level, not the RAL. The RAL, as described in Section 6, only defines where remediation is to occur. Incorporate the original comment.	Text revised to clarify the definition of MNR and natural recovery. Deleted "RALs" from the MNR definition and replaced with "cleanup objective" and "project goals." Although the goal of site-wide remediation is to meet the PRGs/cleanup levels, the location-specific point-based goals of MNR are not the same as the site-wide PRGs/cleanup levels because they are applied on a point-basis.
105	~~54~~ 2-50	2.14.2	A figure must be added or referenced which shows the locations of the 13 supplemental geochemical testing performed on subsurface cores.	A reference was added to the Subsurface Sediment Data Report. This figure was not included in the SRI, and therefore was not included in this document.	Since an SRI figure will be referenced (and is unlikely to be easily accessible to a reader), at least include a brief description of the spatial extent/distribution of the data (e.g. evenly distributed, mostly located in the north, etc.)	Revised per comment (see Section 2.14.1). The cores are evenly distributed across the EW.
151	~~111~~ 4-17	4.3.2	2nd paragraph: "As discussed in Section 3.3, sediment RBTCs based on the seafood consumption pathway were not calculated for cPAHs because correlation between sediment contaminant concentrations and clam receptor tissue concentrations could not be established." Clarify how the FS	Text was added indicating that meeting the cPAH RBTCs developed for RAO 2 (direct contact) are expected to also reduce the risk associated with the consumption of seafood. Consistent with the LDW, data show little relationship between clams and sediment for cPAHs. The clam	The text in section 4.3.2 remains the same as the original and was not revised as indicated. Revise the text per the original comment.	Footnote added to Section 4.3.2 per comment.

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			accounts for cPAH risk from seafood consumption to ensure the remedy is protective.	concentrations may be more related to the water pathway, and water exposures can be related to incoming water from upstream or downstream of the site.		
167	~~121~~ 4-3	~~4.4~~ Table 4.1	Table 4-1: "Waste Treatment Storage and Disposal : Federal" box: correct citation to 42 USC 6901-92k	The table was revised per the comment.	The text remains the same as the original and was not revised. Revise the text per the original comment.	Citation added per comment.
168	~~121~~ 4-3	~~4.4~~ Table 4.1	4-1: "Noise : State" box: correct citation to RCW 70.107; WAC 173- 60-040-050	The table was revised per the comment.	The text remains the same as the original and was not revised. Revise the text per the original comment.	RCW citation has been corrected. WAC citation does not appear to be correct and was not updated.
173	~~124~~ 4-4	~~4.4~~ Table 4-2	Table 4-2: This entire table should be incorporated into Table 4-1 ARARs for the East Waterway. The Regulatory Citations are ARARs, not other legal requirements	The table title was changed to "To-Be-Considered (TBC) environmental criteria that do not qualify as ARARs for the EW" based on comment #118, which appears to contradict this comment. EWG understands that comment #118 is correct and these are not ARARs.	Review by EPA's Office of Council has determined that these regulations are ARARs, not TBCs. They need to be moved into the ARARs table, as per the original comment.	Moved into the ARARs table for consistency with the LDW ROD. EWG does not believe these are ARARs, but this change will have no bearing on the cleanup.
189	~~13~~ 5-14	~~5.2.1~~ 5.2	Figures in Appendix J show the replacement layer to be distinct and different from the clean backfill and dredge residuals. It would likely be easier and more accurate to assume complete mixing of the dredge residual and RMC layer. Appendix J figures need to be adjusted to show the total assumed thickness of each layer. The figures must also acknowledge a 10% loss of residual thickness layer that may affect the replacement layer value.	See response to comment #187. Figures in Appendix J were modified to show the relative thickness of each sediment layer.	The figures in Appdx J do not appear to have been changed. Change per the original comment.	The layers used for model input were agreed upon with EPA during Draft FS Comment Resolution Meetings, and complete mixing with RMC during placement is not assumed. However, figures have been clarified to include depths in cases where depths are constant for all model runs.
204	~~43~~ 5-43	5.5	The text states that mixing assumptions are the same as used for the box model which assumed a clean surface at time zero. MNR areas will not have received clean fill material so an assumption of a clean surface is actually a surface with diluted concentrations. The mixing assumptions must not assume only the introduction of clean material, but actually the then-current surface concentration in top 10 cm at time zero. Specific assumptions used for the different technologies evaluated in the point evaluation need to be reiterated here rather than referring the reader back to the generic discussion of the box model. Figure 5-4 shows a replacement value layer occurring in the top 10 cm for non-remediated areas. This seems inappropriate since no placement or work will be	Mixing assumptions in the text refer to mixing depths, not initial surface concentrations. The point mixing model was conducted for points located in proposed MNR areas (underpier) only, and the point mixing model is consistent with the sediment bed layer models for proposed MNR areas as shown in Figure 1j of Appendix J. The text has been updated to clarify.	Figure 5-5 is consistent with Appdx J Figure 1j (ENR- nav) as indicated in the response, but is still not consistent with Figure 1f (MNR) as was mentioned in the original comment. Continue revising text and figures for consistency as requested in the original comment.	Figure 5-5 does not apply to MNR areas—a note has been added to Figure 5-5 to clarify and refer the reader to Appendix J.

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			completed in those areas. There is some inconsistency because Figure 1f indicates there is no replacement value layer included for MNR areas. Make the text and figures consistent.			
209	~~47~~ 6-2	6.1	See General Comment 3. Clarify what is meant by practical limitations (stormwater treatment will generally be more focused on solids removal than dissolved contaminant removal - for instance).	The text was revised (bullet deleted).	Bullet was not deleted as indicated in the response (second sub-bullet). As requested in original comment, revise text to clarify "practical limitations."	Clarified per comment. Even with large infrastructure investments, some total suspended solids (TSS) will be released.
215	~~54~~ 6-10	6.2.1	Analysis/explanation must be presented (or referenced) to substantiate how the subset of 8 SMS COCs "indicator chemicals" was determined. In particular, EPA needs to understand how remediation to address these 8 COCs will also address exceedances of the other COCs.	The text was revised for clarity; the indicator chemicals are based on empirical evaluation of the SRI/FS dataset. This analysis shows that all samples that exceed the SQS for any COC in the surface sediment or shallow subsurface sediment are included in the remediation area.	(Third paragraph). The revisions only explain that a "site-specific analysis" shows this to be true, but this analysis nor a reference to it is given. Include this analysis or include a reference to it if it was completed as a separate work product.	Text clarified. The analysis was performed in the project database by querying out exceedances for the nine indicator COCs and finding that no other exceedances remained.
230	~~103-104~~ ~~7-47~~	7.5.3 7.5.3.1	Dredging BMPs. Add the following sentence: "Dredging BMPs are known and established now, but can be reasonably expected to evolve between now and actual construction."	The following statement was added: "Known and established dredging BMPs are listed below; however, these can be reasonably expected to evolve between now and actual construction."	Indicated revision was not made. Revise per original comment.	Text was added per comment. Wording modified for readability: "reasonably expected to be" revised to "may."
239	~~121~~ ~~7-66~~	7.8.1.4 7.8.4	Clarify why in situ treatment (which could be ENR with amendments) was removed.	The section number changed to 7.8.4. In situ treatment was retained in the Sill Reach; however, other more common and effective remedial technologies (i.e., ENR and removal) were incorporated into alternatives for stability and effectiveness considerations. Integration of in situ treatment materials (i.e., AC) into ENR sand and gravel may be considered during design.	Concur with change made. However, the first paragraph of 7.8.4 must also be changed to reflect this.	Text revised per comment.
252	~~7~~ ~~8-8~~	8.1.1.8	Regarding the decision to place one residuals layer at the end of construction: The FS needs to further evaluate the impacts of various placement scenarios including the impact of placing a thin layer at the end of each construction season that would minimize short term risks and prevent contaminant transport offsite. Also, further discuss assumptions required to bury the residual layer and provide assessment of how much this would reduce risk.	As agreed to with EPA during Comment Resolution Meetings and WPAM #6, residuals management strategies, considerations, and scenarios are now explored in new Appendix B, Part 5. Placement at the end of each construction season was not included due to probable recontamination from dredging of adjacent areas each subsequent year and vessel traffic. The proposed RMC layer is intended to initially "bury" the residuals layer, but not be an isolation layer, which would require an armored cap that would interfere with navigation depths.	Concur with revisions made (second paragraph). Revisions must also be made to Appdx B, Part 5, Section 3.3.2, which currently indicates RMC may be placed at the end of all dredging or after each year.	Revised per comment.
256	~~12~~ ~~8-13~~	8.1.2.4	The sandy material for EMNR needs to contain significant TOC, at least as much that is naturally present in the sediment.	Per EPA Comment Resolution Meetings (e.g., #3):	Same response to comment #23.	See response to "Backcheck" Comment 23.

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				1) The value of augmenting ENR with carbon is only in the short term (i.e., the first year following construction) because TOC equilibrates rapidly in the BAZ due to benthic recolonization, biological activity, sedimentation, and mixing (based on both local case studies and modeling). 2) Mixing in carbon with ENR and RMC will result in constructability and stability challenges, because carbon is less dense than sand and will resuspend during placement and scour events. 3) There are substantial construction timeframes and cost implications for adding AC to ENR and RMC. The FS states that ENR composition will be evaluated during remedial design. Text has been added to Section 7.2.4 regarding rapid OC re-equilibration.		
282	~~59~~ ~~9-28~~	9.3.1	Risk analysis does not seem to be based on normalized concentrations and changes in TOC based on RMC and capping materials from in situ sediments. Explain if the evaluation considers the effects of TOC. Explain if the TOC returns to the in situ TOC rapidly and when. Explain what the impact of prop wash on fines and TOC are.	Per Comment Resolution Meeting #5, and consistent with the draft FS, the model accounts for the expected amount of TOC in the isolation layer (cap) required to prevent breakthrough of the cap because the model-predicted SWACs and associated risks assume that caps provide complete isolation from underlying contamination. For calculating risk in the long term, the surface of the cap is assumed to equilibrate with the average TOC of the site, consistent with the CSM. The box model incorporates these inputs into future cap surface sediment estimates. No text changes were made. As discussed and presented in WPAM #6 and described in Section 7.2.4, the BAZ is expected to rebound to baseline levels of organic carbon within a year following RMC placement, due to organic carbon in incoming sediment and the load of organic material that accumulates from biological activity at the site.	Same response to comment #23.	See response to "Backcheck" Comment 23.
290	~~Table 9-2 Table 9-4~~	9.3.2	Table 9-2: The 2x spike in baseline total PCB Clam tissue concentrations for the No Action alternative suggests that the mixing	This comment appears to refer to Table 9-4 (tissue concentrations). Baseline concentrations for tissue are based on UCLs	The response states that the baseline concentrations match the year 0 No Action alternative. This is not the case.	Footnote 3 of Table 9-4 was revised to clarify differences between baseline UCL and year 0 for the No Action Alternative.

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			assumptions used are not representative. The mixing assumptions need to be reviewed and adjusted or clarification provided explaining the phenomena.	using tissue data collected from the EW, as reported in the HHRA. Baseline tissue concentrations match the year 0 tissue concentration for the No Action Alternative.	For example, total PCBs for clams has a baseline UCL of 69, whereas the year 0 for the no action is 140. Revise per the original comment. Given many readers will jump to tables to find information, a footnote needs to be added to explain why there is a difference. It is confusing to show that there is a large spike in concentrations if you don't do anything (i.e. no action).	
331	~~235~~ ~~11-23~~	11.4.2	"….diver assisted dredging is more hazardous for work health and safety and likely to have high costs and short-term impacts that are disproportionate to long-term benefits….. due to the significant amount of contaminated sediments that will remain following diver-assisted dredging". EPA acknowledges that a higher risk is associated with diver-assisted dredging. A reference to the implication that higher residuals are consistently a by-product of diver-assisted dredging than other forms of removal needs to be provided. Perhaps the diver-assisted residuals are more a site-specific consideration, so the blanket statements may not be appropriate. In addition, it is a higher fraction (residuals) from a relatively small area (12 acres). If no supporting reference applies, sentence will need to be deleted.	Residuals are discussed in Appendix B, Part 5. Based on references in that section, residuals are higher in areas with underlying hard surfaces and debris and unremoved sediment remaining in riprap interstices. Underpier areas have an underlying riprap surface, significant debris, and piles to work around.	The original comment asked for a reference/explanation about higher residuals with diver assisted hydraulic dredging. The response refers the reader to Appdx B, Part 5. However, that appendix only addresses mechanical dredging. In fact, page 3 states "Both hydraulic and mechanical dredging activities generate residuals, although this memorandum focuses on mechanical dredging methods that are anticipated to be used in the EW." This appendix does not provide the reference requested. Revise per the original comment.	Reference to Section 7.2.6.3 added. The inability to remove all sediment from the underpier areas is due to the riprap slopes and presence of contaminated sediments in the interstices of the riprap.
347	--	Appdx A	See General Comment 1.	Regional background estimate was removed from the appendix.	Additional revisions are needed. Remove instances where an estimate of the regional background value is assumed. For instance, when it is stated, "Because regional background includes impacts from stormwater and other diffuse sources, regional background will be higher than the SCOs for PCBs and dioxins/furans." Since we do not know the value for regional background, one cannot guarantee it will be higher/lower than another value. Revise per Comment 1 and remove references that Regional Background will be considered as a PRG.	The cited sentence was deleted and text was revised per discussion with EPA (June 12, 2017). However, based on the CSM for the EW and contribution of diffuse sources to the area, we can safely say that regional background will be higher than natural background for PCBs and dioxins/furans. Although regional background is not a PRG in this document, regional background may be considered for future cleanup level adjustment.

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379	5 4	Appdx D; 3	The LDW FS found that the sedimentation rate is critical to allow use of RALs because even very small sedimentation results in no contaminant breakthrough. Since there is significant uncertainty regarding the rate—or even occurrence–of sedimentation within the EW, the analysis needs to focus on or at least include on a "0" sedimentation rate scenario. Note also that the term RALs have to be replaced with "Action Level"	The best estimate of site-wide net sedimentation rate in the EW was revised to 1.2 cm/yr based on Comment Resolution Meeting discussions. A low sensitivity value of 0 cm/yr sedimentation rate scenario is also evaluated. The term RAL is not used in Appendix D – comment addressed in Section 6.	The low-end was set to zero for the cap modeling as requested. EPA recognizes that because this value is used as a worse case scenario, it does not match the box model low-end estimate of 0.5 from Appdx J. Include a footnote to Table 1 to acknowledge this difference and explain that 0 is being used here as an extreme case to represent the uncertainty.	Table 1 text was modified, and a footnote was added to explain why low cap model net sedimentation rate is different than low box model net sedimentation rate.
404	8 9	Appdx F, (Sect 3)	The appendix needs to explain how cap thickness was determined and what size armor stone is expected to be stable once placed.	A reference was added to Section 7.2.5.1, where this is discussed.	The reference added was for section 7.2. Revise to 7.2.5.1 as indicated.	Text revised per comment.
413	4 5	Appdx H; 2	Explain why the upper 2 feet in areas under and south of Spokane St Bridge were not included for evaluation. There were SMS exceedances identified in the RI that are not targeted for removal. Also, as noted elsewhere, rather than designating the remediation area by the upper 2 feet only, in areas where the maximum mixing depth is greater than 2 feet, the maximum mixing depth needs to be used.	• The remediation footprint is developed in FS Section 6. The exceedance polygon south of the Spokane Street Bridge is discussed (benthic toxicity pass). • As discussed in Comment Resolution Meeting #2, establishing the remedial footprint using surface and shallow subsurface sediment concentrations in the upper 2 feet is a conservative assumption and is maintained in the Draft Final FS. Some areas are predicted to have less than 2 feet of scour from vessel operations (FS Figure 5-1) and only parts of each operational propwash area will be subjected to scour. Comparing RALs to the maximum predicted mixing depth (e.g., up to 4.7 feet below mudline in some areas) is overly conservative based on spatial variability of predicted scour and the fact that scour was approximated to represent worst case for modeling purposes.	• As the response indicated, the description in FS Section 6 does contain the same language of "…the upper 2 feet of subsurface sediment for all areas north of the Spokane Street Bridge." However, there needs to be an analogous discussion for the areas under and south of Spokane St. Bridge. Revise the language in FS Section 6 to include this and copy here. • (Concur with second bullet response.)	Statement added to Section 3 of Appendix H and FS Section 6.1.1 regarding lack of the same propwash forces under and south of the Spokane Street Bridge.
422	1	Appdx J; 1	The purpose of the Point Mixing Model needs to be clarified and better explained throughout the document. Here it is getting defined to evaluate the performance of ENR/MNR over time; however, elsewhere in the document it appears as though the Point Mixing Modeling is used to determine compliance with SMS over time. An evaluation to assess this compliance would need to be alternative-specific, have (many) more than just 18 data points, and needs to	The purpose of the point mixing model is to develop surface concentrations at specific points where MNR may be proposed as a remedial technology. It is not a stand-alone evaluation; instead the results of these calculations (for 18 points) will be combined with surface concentrations for more than 400 points within open-water areas that will be actively remediated using dredging, capping, or ENR technologies. This	There are still inconsistencies in Appdx J as to the purpose of the point model. For example, in Section 1 the second bullet, the point model is described as assessing "Performance of MNR Areas Over Time", but Section 3 is titled "Site Performance over Time" (MNR areas vs. entire site). Revise Appdx J to be more consistent with what the purpose of	Revised for clarity and consistency with FS Section 5. Section 3 and bullet in Section 1 retitled to "RAO 3" performance over time.

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			be representative of all technologies. The current explanation is confusing, incomplete and insufficient to readily demonstrate compliance. In addition, the Point Mixing Model results must present the data trends over time, even if the results do not show any exceedances. More rationale must be presented to explain and show where point mixing model locations were selected.	evaluation to determine compliance for RAO 3 (benthic) is provided in Section 9 of the FS.	the point model is (evaluation of just MNR areas or the entire site?).	
453	25 36	Appdx J; 4.1 4	Clarify if future conditions for upstream loads (source control) were considered.	Source control for upstream incoming solids was not considered as part of the EW FS due to uncertainty in timeframe and scope of those controls. Source control for most EW lateral sources was taken into account in the evaluation. However, future source control effectiveness for many EW laterals is uncertain, so those were changed only if there was some certainly in reductions. Otherwise, no reduction was assumed in the evaluation, which is conservative.	This response is sufficient but needs to be included in Appdx J.	Text was added to Note 2 of Chart 2 in Section 2.1.2.1.